THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—24TH YEAR. SYDNEY, SATURDAY, MARCH 6, 1937. No. 10.

Table of Contents.

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES— Page.
Heart Disease and National Welfare, by A. R. SOUTHWOOD, E.D., M.D., M.S., M.R.C.P. 349
Anxiety and the Heart: With an Analysis of Cases, by R. WHISHAW, M.B., Ch.M., M.R.C.P. 360
Blood Transfusion: A Closed Method of Collection and Administration, by W. HUGH MILROY, M.B., B.S., and A. D. MATHESON, M.B., B.S. .. 366

REVIEWS—
Asthma 368

LEADING ARTICLES—
The National Health and Medical Research Council 369

CURRENT COMMENT—
Foods and their Value 370
The Dangers of Carbon Tetrachloride in Industry 371
Immunity in Malaria 371

ABSTRACTS FROM CURRENT MEDICAL LITERATURE—
Surgery 372

RESEARCH—
The National Health and Medical Research Council 374

BRITISH MEDICAL ASSOCIATION NEWS—
Victorian Branch News 383
Notice 384
Nominations and Elections 384

MEDICAL SOCIETIES— Page.
The Urological Society of Australasia 384

ROYAL COLLEGE OF SURGEONS OF ENGLAND—
Primary Fellowship Examination 384

CORRESPONDENCE—
Gout in Australia 384
Analgesia during Labour 385

POST-GRADUATE WORK—
Week-End Course at Wagga Wagga 385

PORTRAIT OF PROFESSOR W. A. OSBORNE .. 385

OBITUARY—
Albert Harding Porter 385

DIARY FOR THE MONTH 386

MEDICAL APPOINTMENTS 386

MEDICAL APPOINTMENTS VACANT, ETC. 386

MEDICAL APPOINTMENTS: IMPORTANT NOTICE 386

EDITORIAL NOTICES 386

HEART DISEASE AND NATIONAL WELFARE.[1]

By A. R. SOUTHWOOD, E.D., M.D., M.S. (Adelaide), M.R.C.P. (London),

Honorary Physician, Adelaide Hospital; Chairman, Central Board of Health of South Australia.

Statistical Review.

IT is essential in dealing with any problem to get some idea of its size. Hardly anywhere in the world are accurate statistics available on the subject of heart disease. There is lack of reliable data from which morbidity rates may be estimated, and the interpretation of mortality statistics is beset with difficulties.

"Heart disease" is finding a place on death certificates with astounding frequency. Fashions in terminology and in certification are partly responsible for this. "Senility" figures less often on certificates now, and its place is taken by "arteriosclerosis and heart failure". In their late stages the diagnosis between heart disease and chronic nephritis is often difficult, though in recent years the distinctions are being clarified. Cerebral hæmorrhage and other vascular disturbances are best regarded as circulatory diseases rather than as diseases of special organs. Such are but a few of the points that arise in recording and interpreting mortality statistics. To reduce the fallacies, some medical statisticians have adopted the plan of summarizing diseases of the heart, of blood vessels and chronic diseases of the kidney, grouping them as cardio-vascular-renal diseases. This plan is followed in this address.

Through the courtesy of Mr. A. W. Bowden, A.I.A., Government Statist in South Australia, I

[1] President's address to the Section of Medical Science and National Health of the Australian and New Zealand Association for the Advancement of Science, delivered at Auckland on January 12, 1937.

am able to produce a series of charts to illustrate the position in Australia. Chart I shows the deaths in age groups in 1933—the latest census year—and the proportion of cardio-vascular-renal deaths in decennial groups. The chart is compiled from the average figures for the three years, 1932, 1933 and 1934. Chart II shows the alteration in death rates from cardio-vascular-renal diseases in decennial age groups at the census years of 1921 and 1933, compared with the year 1911, also a census year. There has been a large fall in the death rate from these diseases in persons below the age of sixty years, and the rise is striking only in age groups beyond seventy years.

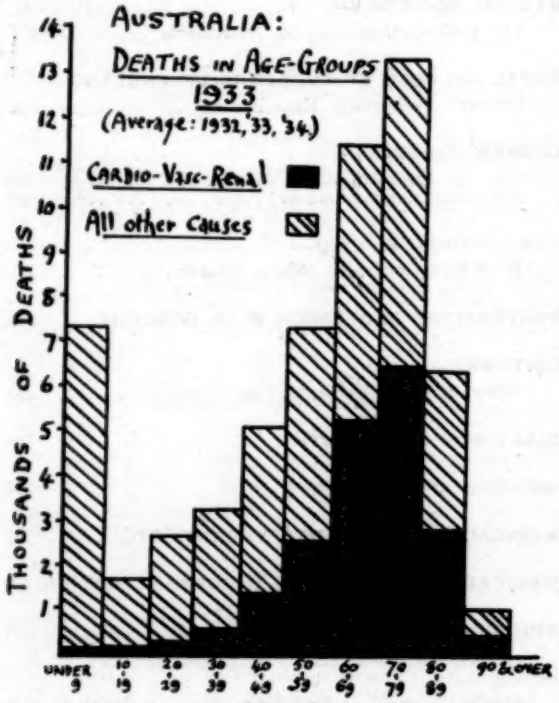

Chart I.

Showing number of deaths in the Commonwealth of Australia from cardio-vascular-renal diseases and from all other causes, arranged in decennial age groups, and representing the average for the years 1932, 1933, 1934.

Mr. Bowden has explained that death rates from senility and "ill-defined" conditions were affected by a change in classification practice in 1932. Prior to that year a comparatively large number of deaths were returned as due to "heart failure" without further qualification. If such deaths occurred at ages under seventy years, they were classified as "ill-defined"; if over seventy, as "senility". This change is reflected in the crude death rates for 1933 as compared with 1921. For that reason deaths from senility and "ill-defined" deaths have been combined with deaths from the cardio-vascular-renal group to arrive at a combined death rate which, it is thought, may give a better indication of the relative mortality from heart disease and allied troubles.

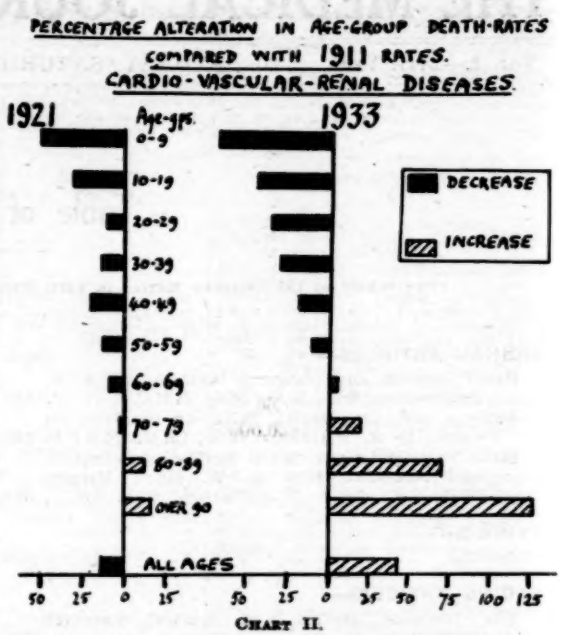

Chart II.

Showing the percentage alteration in death rates from cardio-vascular-renal diseases, arranged in decennial age groups, and comparing each of the years 1921 and 1933 with the year 1911. The chart is based on the statistics of the Official Year Books for the Commonwealth of Australia.

Chart III shows the percentage alteration of the death rates in decennial age groups from this large combined group. At all age groups a fall is noted.

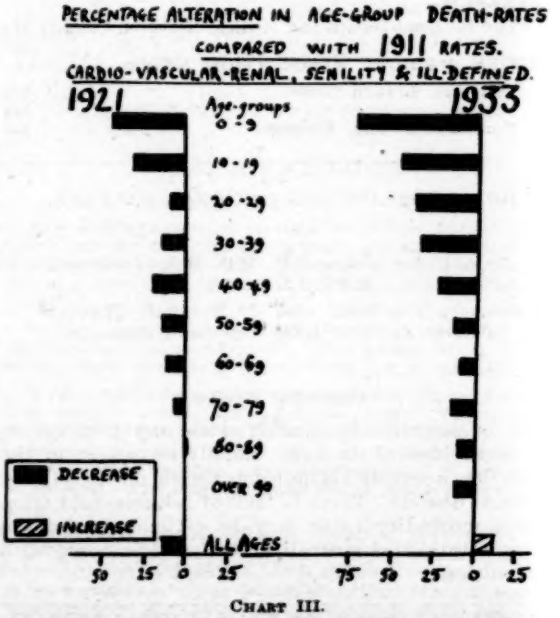

Chart III.

Illustrating the alteration in death rates for the combined conditions, cardio-vascular-renal diseases, senility and "ill-defined" cases. The basis of the chart is similar to that of Chart II.

Actually the "ill-defined" group is very small. The rates for cardio-vascular-renal deaths and for senility in age groups over sixty years for 1911 and 1933 (based on three-year average) are as under:

TABLE I.

Death Rates in Age Groups per 10,000 Population in such Groups from Causes Shown, for Years 1911 and 1933.

Age Group.	Year 1911.		Year 1933.	
	Cardio-vascular-renal.	Senility.	Cardio-vascular-renal.	Senility.
60 to 69	40·37	6·04	41·99	0·99
70 to 79	90·22	55·05	107·42	16·58
80 to 89	140·32	242·61	237·80	107·86
90 and over	155·37	696·80	348·88	395·89

In round figures, of the 60,000 total deaths each year in Australia, about 20,000 are due to cardio-vascular-renal diseases, 7,000 to cancer, and 3,000 to tuberculosis. Accurate assessment of the mortality from the various diseases of the heart and circulation is difficult.

The morbidity is even harder to assess. The incidence of diseases of the heart revealed by the routine medical examination of school children is variable. In New York, in a series of over a million examinations, just over 1% of children were found to be subjects of some form of heart disease. In England, in a series of 600,000 children, 0·7% were affected. In South Australia, in a series of 163,000 children examined over a period of some years, 0·49% were affected. Statistics are not available indicating the precise nature of the heart disease found in the children, but it is probable that congenital heart disease accounts for about 10% or less of the cases, and acquired heart disease, mainly of rheumatic origin, for 90%.

In England and Wales during 1934, for every 1,000 deaths recorded, diseases of the heart and circulation accounted for 282, bronchitis and other respiratory diseases for 105, cancer for 132, tuberculosis (all forms) for 65. In 1920, diseases of the heart and circulation caused only 140 of each 1,000 deaths. In Australia in 1934, diseases of the heart and circulation caused 319 of each 1,000 deaths.

Chart IV is based on Australian figures and shows the death rates from main causes of death in the census years 1911, 1921 and 1933. It may be noted that the death rates for all causes of death in those years were respectively 109·0, 99·1 and 89·5 per 10,000 population.

Chart V is also based on Australian figures. It shows the deaths, as thousands, from main causes in 1933.

The statistics indicate that the number of deaths recorded as due to diseases of the heart has increased rapidly during recent years. The situation, however, is not so serious as it might appear, and presents some favourable features. One striking fact is that the population of civilized countries is ageing—people are living longer, and a far greater proportion of people of older years now exists than has ever existed before. Chart VI shows the change occurring in Australia in the age groups of the population. This increased longevity is largely attributable to improved hygienic conditions. The ravages of infectious diseases are becoming less.

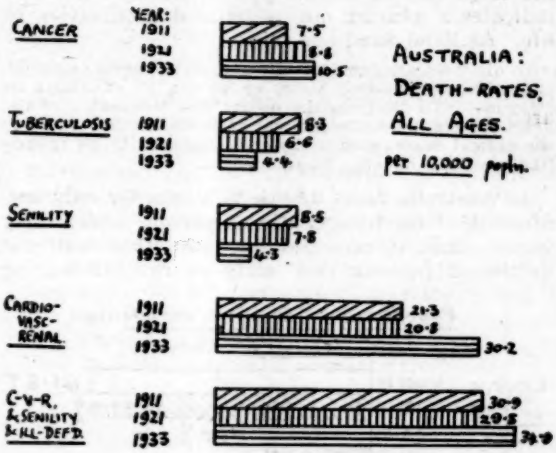

CHART IV.

Death rates for main causes of death in the Commonwealth of Australia in the years 1911, 1921 and 1933. Based on statistics of the Official Year Books.

The death rates from typhoid fever and diphtheria are barely one-twentieth of their level thirty years ago, and the tuberculosis death rate has been more than halved. Moreover, even in diseases of the heart the death rate in the younger age groups tends to

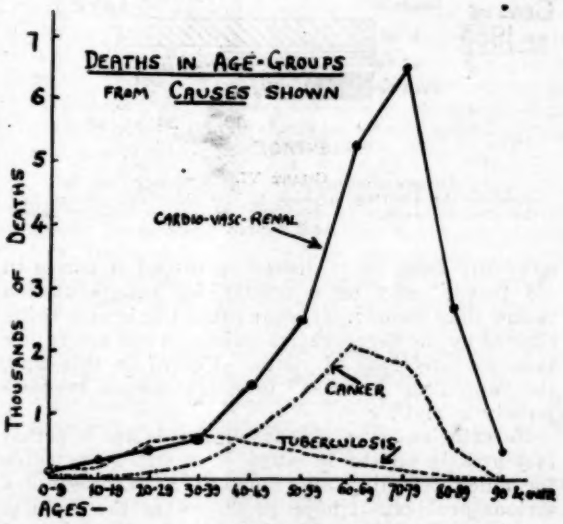

CHART V.

Deaths from main causes for the year 1933, arranged in decennial age groups, and based on statistics of the Official Year Books for the Commonwealth of Australia.

fall, although, for all ages combined, the rate has increased. The increased death rate from heart disease is almost a phenomenon of middle life and old age, for the senescent or arteriosclerotic type

causes the bulk of the deaths. Myocardial disease of the degenerative type is replacing valvular disease of the heart as a cause of death. The fact that so great a proportion of heart disease of late life is of this senescent type is favourable, for it indicates a wearing out—a natural termination of life. As René Sand has said:

> To die from accident, infectious disease, cancer, appendicitis, diabetes, gastric ulcer, or to die in childbirth is abnormal. To die from the progressive weakening of the heart muscle, from the gradual sclerosis of the vessels is the normal death, even if the end is marked by an episode like apoplexy or broncho-pneumonia.

In Australia heart disease accounts for only one-fifteenth of the total deaths of persons under forty years, while it accounts for more than half the deaths of persons over sixty years. Increasing

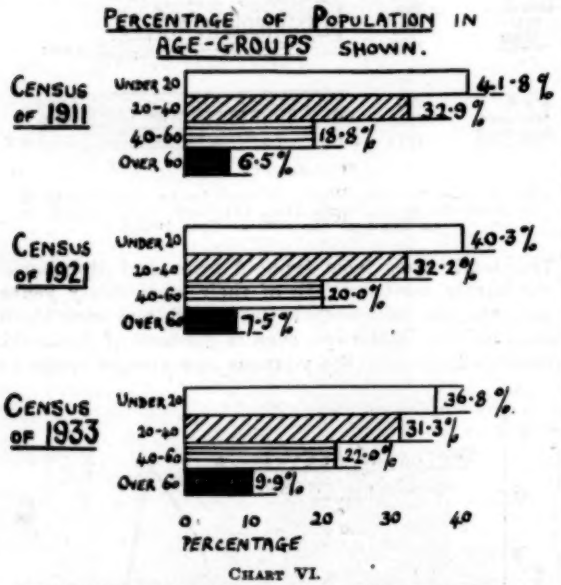

Chart VI.

Showing the relative increase in the older age groups in the Commonwealth of Australia, based on Official Year Book figures.

mortality from heart disease, provided it comes in old people, may be a matter for congratulation rather than dismay. It means that life is now being limited by the degenerative lesions of old age rather than by infections of youth. Viewed in this way, the "appalling increase" in heart disease becomes largely a myth.

Nevertheless, even if heart disease is not in actual fact greatly on the increase, it is still responsible for much crippling and mortality. It presents a serious problem. I hope to show that the problem has important features of public health interest, and to indicate some methods of attack. My address embodies no announcement of any original research on my part. It is rather a compilation, based on the work of such masters as Mackenzie and Lewis in cardiology, and as Sir George Newman in public health. To these, and to the scores of others whose writings have helped me, I express my gratitude.

The Nature and Types of Heart Disease.

The Main Causes.

Heart disease is not a single entity, a disease in itself. There is no one germ to blame for it. It is not due to a single cause, as tuberculosis is. It is rather a group of diseases with a variety of causes.

The study of the causes of disease is a basic principle of preventive medicine—we must know the causes if we are to prevent the diseases. This principle applies with great force to diseases affecting the heart.

The main causes of heart disease are:

Congenital Defects.—Congenital disease of the heart is distinct from acquired forms, for it is a congenital malformation—a failure of development—rather than a disease. There are several kinds of congenital defect, and the stage in the development of the embryo at which retardation or abnormality occurs largely decides the type of congenital heart disease found later. Extreme developmental failure is incompatible with life, and even in the small proportion of subjects with congenital heart disease who reach adult life the situation is serious. Physical activity is more or less limited, and the lesions in the heart are liable to dangerous bacterial infection, especially of a streptococcal nature.

Rheumatic Infection.—The term "rheumatism" is much abused, and the condition is poorly defined. The rheumatic infection discussed here is rheumatic fever or acute rheumatism. It is distinct from the chronic forms of rheumatism, such as rheumatoid arthritis, muscular rheumatism, or rheumatic gout, fibrositis and the like—the "rheumatics" to which a large proportion of middle-aged and older people fall victims. It is not appreciated by the general community that St. Vitus's dance or chorea, tonsillitis in many cases, and such minor disturbances as the so-called "growing pains" of childhood are also evidence of rheumatic infection and may be accompanied by heart disease. It is probable that in over 80% of rheumatic fever cases and in about 40% of chorea cases there is some degree of permanent cardiac damage.

Syphilis.—Syphilis accounts for a moderate proportion of heart disease, variously estimated at from 5% to 10%. The aorta and the aortic valves are especially attacked. The relative importance of acute rheumatism and syphilis as the cause of disease of the aortic valves has been variously estimated. In patients of all ages with aortic valvular disease, roughly two-thirds of the cases are due to acute rheumatism, one-sixth to syphilis, and one-sixth to atheroma and other causes.

Hyperpiesia.—Hyperpiesia, or high blood pressure not associated with chronic nephritis or thyreotoxicosis, accounts for a large proportion of the cases of heart disease. Here the cause of the heart disease is known—it is the overwork imposed by the persistent high pressure in the systemic

arteries—but the cause of the high blood pressure is still in doubt. Hyperpiesia accounts for fully 95% of the cases of hypertensive heart disease, and chronic nephritis for most of the rest. Heart failure is the most common end result of persistent high blood pressure; it accounts for about half of the deaths of hyperpiesia subjects, and represents the breaking down of the hypertrophied, overworked heart.

Arteriosclerotic Heart Disease.—Arteriosclerotic heart disease, or senile cardiosclerosis, is a degenerative state and a more or less natural change in the elderly. Many medical writers do not discriminate between heart disease from persistent high blood pressure and heart disease from arteriosclerosis. Yet there are distinctions to be made, for although the continued high blood pressure in younger persons leads to the premature development of arteriosclerosis, the underlying nature of the two troubles is distinct. Arteriosclerosis is not always accompanied by raised blood pressure, and in some persons high blood pressure may continue for many years without recognizable development of degenerative changes in the arteries. Towards the end of life, degenerative changes are liable to affect coronary blood vessels—the vessels of the heart itself—and constitute a very important cause of heart trouble. The coronary disease of old people is not controllable, for it is only one of the general changes of senescence. But preventive medicine must take cognizance of coronary disease when it cripples or kills in the prime of life; the premature ageing of the blood vessels may be preventible.

Disorders of the Thyreoid Gland.—Tachycardia and other evidences of circulatory disturbance are common symptoms in thyreotoxicosis. Actual permanent cardiac disease is far less common, and is most likely to be associated with high blood pressure or long-continued auricular fibrillation. The condition of myxœdema of the heart is also rare.

Miscellaneous Causes.—Influenza, diphtheria, scarlet fever, tuberculosis and pneumonia are not common causes of heart disease. Although the acute phases of these illnesses cause some degree of toxic myocarditis, acute and subacute bacterial endocarditis are unlikely apart from preexisting valvular disease. Acute infections are commonly the precipitating cause of failure of diseased hearts. Pregnancy and athletic exercises do not of themselves cause heart disease, but they make extra demands on the circulation and thus may seriously aggravate preexisting weakness.

Relative Incidence of Different Types of Heart Disease.

Accurate assessment of the relative incidence of different types of heart disease is extremely difficult. The grouping of death statistics is not on ætiological lines. The records of well-conducted hospitals are most helpful, and in a recent study of thirteen hospitals in different centres in the British Isles, involving 2,680 cases of heart disease, Bruce Perry gave the following figures:

Rheumatism	38·4
Senile cardiosclerosis	19·1
Hyperpiesia	12·7
Thyreotoxicosis	10·7
Syphilis	6·5
Ulcerative endocarditis	2·3
Various	5·1
Functional	3·8
Congenital	1·1

These figures give a useful general idea of the relative incidence among hospital patients of all ages. In children's hospitals, of course, practically all heart disease is rheumatic, while in infirmaries for the aged, senile cardiosclerosis is the predominating cause. The study of cases occurring in private practice shows some difference in the proportions, for the incidence of rheumatic infection is distinctly lower in private practice than in hospitals. In a broad general way the figures for the main types of heart disease for the community as a whole are: 20% rheumatic, 10% syphilitic, and 50% to 60% hyperpietic and arteriosclerotic.

Heart Disease in Different Age Groups.

In childhood, congenital heart disease accounts for but a small proportion of cases. The main cause of heart disease in childhood and in young adult life is rheumatic fever. Eight of every ten cases of organic heart disease occurring in persons under the age of forty are rheumatic in origin. In a group of 1,000 cases of rheumatic heart disease investigated by White and Jones in America, just over 400 occurred in persons under the age of twenty years and 700 had occurred before the age of forty. It is interesting to note that the age incidence of subacute bacterial endocarditis is similar to that of rheumatic infection. This is to be expected, seeing that bacterial endocarditis is so commonly grafted upon valves previously damaged by rheumatic infection. Throughout the world rheumatic heart disease is still one of the chief scourges of childhood and young adult life.

In middle life the cardiac effects of high blood pressure, of arterial disease and of thyreoid disease assert themselves. Syphilis also takes its greatest toll in middle life, while rheumatic infection becomes of decreasing importance. In a series of 100 cases of cardio-vascular syphilis, 60 occurred in patients between the ages of forty and sixty years. In heart disease from hyperpiesia about half the cases occur in late middle life.

In the elderly, arterial degeneration is the predominating cause; sclerosis of the coronary vessels and myocardial degeneration commonly lead to cardiac failure. Over 90% of cases of coronary disease occur after the age of fifty years.

The Course of Heart Disease.

Diseases may have their effect on the heart either by directly damaging the myocardium itself or by imposing increased work on the heart. Persistent high blood pressure and damaged heart valves are alike in their effects—they give the myocardium more work to do. The heart is a very tolerant organ,

and for years it may continue to work under great difficulties. The time comes, however, when the added burdens prove too heavy.

Three stages in the life history of heart disease are available for study: (i) the period of injury, when the heart is being attacked; (ii) the silent period, without any obvious symptoms; and (iii) the period of symptoms.

In the silent period the damaged heart is less able to withstand "the slings and arrows" of the daily tasks, and the effects of ageing of the tissues and nutritional changes in the myocardium further impair its efficiency.

Infections, especially infections of the respiratory tract, are a grave danger to people with damaged hearts. The physical strain of coughing and the effects of toxins on the myocardium are a heavy burden. Anæmia, obesity, pregnancy, over-exertion and worry may also precipitate the period of symptoms. The ready development of fatigue and of breathlessness on mild exertion occurs early in this period, and congestive failure and circulatory stagnation follow.

Rheumatic heart disease occurs in 60% of cases before the age of twenty years, and in 95% before the age of forty. Of people dying from rheumatic heart disease, 70% die before the age of forty. The period of time between infection and the development of disabling symptoms averages about four years; it is usually longer in those attacked early in life than in those attacked after the age of twenty. There follows a period of about seven years in which disabling symptoms intermittently cause interference, varying in degree somewhat with the occupation of the patient. Then follows a period of three or four years of increasing, and later complete, disability till death results from cardiac failure.

The course of syphilitic heart disease and of degenerative forms of heart disease is similarly indicated. In syphilis, infection generally occurs before the age of forty, and 85% of the deaths occur after forty. The interval between the time of infection and death from heart disease is usually about twenty-five years. In hyperpietic and arteriosclerotic heart disease the onset and the termination both occur after the age of forty.

Whatever the primary cause of the cardiac damage, circulatory failure is the dreaded sword of Damocles overhanging the unfortunate victim.

Rheumatic Fever.

Incidence and Nature of Rheumatic Fever.

Rheumatic fever is a common disease of most temperate climates. In the tropics the joint manifestations are not commonly observed, but other types of the infection, such as cardiac disease, probably occur as commonly in tropical as in temperate climes.

Accurate figures as to the morbidity rate of rheumatic fever are not obtainable, for generally the disease is not a notifiable one. The mortality in Australia is about 200 deaths throughout the Commonwealth *per annum*. Statistics compiled from the records of eleven large public hospitals in various cities of Australia show that, over a period varying from ten to thirty years, 6,484 patients with acute rheumatic fever were admitted and there were 206 deaths. It is a fair estimate that at least 10,000 persons in Australia suffer each year from rheumatic fever. If the cases in which rheumatic infection is masked or atypical were added, the figure would probably be doubled.

In children's hospitals in Australia, rheumatic fever cases make up about 1% of the patients admitted; in similar hospitals in England the figure is about 3%. In public hospitals for adults in Australia, less than 0·5% of those admitted have rheumatic fever.

The infection of rheumatic fever is a general one; the joint manifestations are but one feature. The French physician Lasegue once made a striking statement which ought to be preserved: "Rheumatism is a disease which licks the joints, but bites the heart." It must be emphasized, too, that rheumatic heart disease is not merely an occasional complication of rheumatic infection. It is an integral part of the disease.

After an acute course of three or four weeks, rheumatic fever is usually followed by a long period of convalescence. The infection is a slow, lingering one, and the heart is in danger until the invasion is spent. Practically all acute heart disease in childhood is due to rheumatic infection. It is probable, too, that in every case of rheumatic infection there is some heart disease; it may be slight or transient, and in some cases it is followed by complete recovery.

Rheumatic infections are especially common among poor people whose housing conditions are defective. It has been observed, for instance, that in Windsor (England) rheumatic fever is fairly frequent, but that on the other bank of the Thames, at Eton College, among boys of the same age, the illness is practically unknown. Statistics support the view that the incidence of acute rheumatism increases directly with poverty, malnutrition and overcrowding.

Special Inquiries into Rheumatic Fever.

During recent years several elaborate investigations have been made in various countries into rheumatic fever incidence and the methods of dealing with the problem.

In 1926 an inquiry was organized by the British Medical Association in England into the subject of the prevention and treatment of cardiac rheumatism. Unsatisfactory living conditions, such as damp in houses, were found to be an important factor. The bacteriology of rheumatic infection, and the effect of tonsillectomy in rheumatic infection in children were also studied, and a report was made on the organized after-care of rheumatic children in Great Britain.

Dr. Glover, of the Ministry of Health in England, discussed the results of his investigations in the Milroy Lectures before the Royal College of

Physicians in London in 1930. He found it difficult to get accurate statistics as to the morbidity rate of rheumatic fever. He deplored the continued high incidence of rheumatic heart disease, robbing many of happy youth or vigorous manhood. His investigations indicated that acute rheumatism was slowly but surely being conquered, but that complete triumph over the disease was still far off.

Dr. E. Britten Jones, of Adelaide, in his presidential address to the South Australian Branch of the British Medical Association in 1934, presented the results of special investigations he had made into the occurrence of rheumatic heart disease in South Australia. He urged that a thorough study of the subject should be made and that treatment facilities should be increased.

Other studies have been made in recent years under the ægis of the American Heart Association, and much useful propaganda on the subject has emanated from this source.

Some recent investigations have been made in the Australian States. In New South Wales, Dr. Kempson Maddox, acting in conjunction with a special committee, has accumulated statistical data and other material on the subject. Much valuable work has been done, and Dr. Maddox's report will shortly be published.

Cause of Rheumatic Fever.

Although poverty, damp and overcrowding are recognized as general factors, the actual cause of rheumatic infection is not yet clear. It is almost certainly bacterial and streptococcal in type, yet some features of the illness are difficult to explain on the basis of streptococcal infection alone.

The recent work of Coburn in New York is illuminating. Coburn discusses rheumatic fever in three phases. In the first phase, which lasts only a few days, hæmolytic streptococci are to be found in the upper respiratory passages. The second phase, in which no definite symptoms of rheumatism may occur, usually lasts from one to two weeks, but may continue as long as six weeks. In the third phase of the infection the actual rheumatic manifestations occur. Coburn considers that the second phase, the nature of which is still rather a puzzle, is the most important from the immunological standpoint and is crucial in the development of rheumatic activity. It seems probable that rheumatic fever is an abnormal and exceptional type of response to streptococcal infection. It may be, as has been suggested, that a virus infection is associated and that the infection is of dual nature. Final judgement is for the future. The streptococci as a group certainly constitute one of the great enemies of mankind, and the hope is that "Prontosil", now being investigated, or some other substance may prove useful in treatment.

The Management of Rheumatic Fever from the Heart Standpoint.

Acute Phase.—Special care must be taken to ensure the thorough resting of the patient during the acute stage of the illness. The resumption of general bodily activity must be very gradual, and can be decided upon only by the watchful physician.

The value of tonsillectomy, for many years considered an important prophylactic measure against acute rheumatism, has recently been brought into question. No sufficient case appears to have been made out for the routine removal of apparently healthy tonsils in a rheumatic or potentially rheumatic child, simply as a measure of prophylaxis against acute rheumatism. Removal should be undertaken only if there is some definite local condition, such as obvious enlargement or disease, associated adenitis, or ill-health caused by the obstructive size of the tonsil. One point is agreed upon by all authorities, namely, that when removal is necessary the enucleation must be complete; from the rheumatic point of view, the stump of an imperfectly removed septic tonsil is more dangerous than the original tonsil. In the rheumatic child the only justification for removal of tonsils is when the general health is being undermined by repeated sore throats or very septic tonsils. Especially is their removal contraindicated during or immediately after an attack of rheumatism or of acute tonsillitis.

Management in Convalescence.—The greatest advance in the knowledge of rheumatic fever has been the recognition of the need for proper management in the convalescent stage. The active stage of the infection is treated by rest in bed, but there comes a time when it is difficult or impossible to be sure whether or not the infection has completely subsided. The physician is greatly helped by the observation of the temperature chart, of sleep pulse rate, of weight, of general condition, and of the sedimentation rates of the red corpuscles. The control of restless children who feel well enough to run about may be difficult. Much discretion must be used. For such cases care in institutions where the discipline is good, or supervision by able nurses, is essential during the active stage of the infection.

The organized after-care of patients with rheumatic heart disease is important. In some cases it may be necessary for a child to remain at rest under medical care for a period of many months. During that time the child may not be acutely ill, and may indeed be able to undertake a regulated amount of bodily exercise. The education of the child has to be considered in these circumstances, and the great value to be derived from hospital schools must be recognized. In these schools the education of the child along the ordinary lines of the curriculum can be provided for, concurrently with medical supervision.

Rest under good hygienic conditions, and preferably in the open air, is the principal feature of treatment. The details in the management of the convalescent stage in use at Carshalton Hospital in England have been described by Dr. N. Gray Hill. Every child is nursed in bed for at least three months after admission, and the total period of treatment at Carshalton is at least six months. At first the patient is kept absolutely flat, except for a low pillow, and then by degrees is allowed to

sit up for strictly specified and gradually lengthened periods. If all goes well, after four months he is allowed up, at first only for an hour daily, with no exercise. When two hours daily have been reached he is transferred from a "recumbent" to a "convalescent" ward. When he is up for half a day or more, he has exercises, games and dancing, and gradually resumes the normal activities of a healthy child. A certain number of selected patients, after five or six months at Carshalton, are transferred to a seaside convalescent home at Millfield, Littlehampton, Sussex, where they live the life of ordinary, healthy children, but are under general medical supervision. Finally they are readmitted to Queen Mary's Hospital for a week or two, so that their condition can be once more reviewed before they are passed for discharge. Discharge is followed by observation and periodical examination, either by the school medical officers of the London County Council, or in those general hospitals, such as Guy's Hospital and Saint Thomas's Hospital, where there are special rheumatism clinics, which work in close cooperation with Carshalton.

The hospital schools at Carshalton and at Brentwood, in Essex, are excellent examples of the suitable type of institution. The Lord Mayor Treloar's Cripple Hospital at Alton in England, conducted by Sir Henry Gauvain, is another excellent example of a hospital school. The rheumatism scheme of the London County Council provides for acute and subacute cases up to 630 beds, with convalescent cases up to 200. Nearly 1,700 children were admitted to the special institutions for treatment in 1935.

Rheumatism Supervisory Centres.—In some countries acute rheumatism is notifiable to health authorities and official supervision of cases is conducted. An experimental scheme of this type has been operating in some of the London boroughs during the last few years. There are difficulties, however, which render compulsory notification of doubtful value in the case of a disease so protean and indefinite in character as rheumatism in children. The schemes have been of value as experiments of a system which deserved trial.

The supervisory centre is primarily for diagnosis. The real value to the patient of supervision must ultimately depend upon the facilities for institutional treatment available and the appropriate modification of the children's personal and domestic environment.

The rheumatism supervisory centres in England act in close liaison with the school medical service, care committees, and branches of the Invalid Children's Aid Association, as well as with the hospitals from which the patients who have had institutional treatment come. The chief functions of such a centre are: First, diagnosis; in other words, to determine three questions: Is the case one of rheumatism? Is the infection active? Is there carditis? Secondly, the arrangements for appropriate treatment or regimen of life. Thirdly, continuous supervision to detect active infection or relapse. Fourthly, study and investigation of the case. Fifthly, the compilation of statistics for research purposes. And lastly, the education of the parents in the necessary care of the child.

The growth of rheumatism supervisory centres in London is shown by the fact that in 1930 less than 7,000 attendances were recorded, while in 1933 nearly 15,000 attended. The centres appear to encroach neither on the work of the private practitioner nor on that of any hospital, but to fill an obvious gap by providing supervision, when necessary, of many children who would not in the ordinary way attend any doctor until perhaps irreparable cardiac damage had been done.

In Australia, organizations of this type have not been developed to any great extent. A beginning has been made in some of the cities, especially in association with children's hospitals. At Mount Arcadia, near Sydney, a special hospital for rheumatic heart cases is conducted by a charitable organization, known as "The Smith Family". A committee has also been formed in Sydney to arrange for the provision of educational facilities for rheumatic children. In Adelaide a rheumatism supervisory clinic is conducted at the Adelaide Children's Hospital, and a small group of beds is available at Estcourt House, at the seaside and about eight miles from the city, for the prolonged observation and care of rheumatic "heart cripples" in the convalescent stages. Although the scheme is a small one, the general arrangements are excellent.

Vocational Training.—The extension of the hospital school idea is the provision of technical training for young adults whose hearts are affected. Here again it is only by proper organization that satisfactory results can be achieved. What must be recognized is that the crippling of the heart by rheumatic infections is just as serious a matter as the crippling of limbs from paralysis. In each case the affected person may be suitably trained to do useful work and perhaps earn a livelihood if the opportunity for training is seized at the right time and in a proper manner.

The Opportunity for Preventive Medicine.

Acute rheumatic infection must now be recognized as affording one of the major opportunities of preventive medicine: the fleeting opportunity to prevent organic heart disease.

The chief importance of acute rheumatism from the public health standpoint lies not in the relatively small mortality nor in the considerable invalidity immediately due to it, but in the cardiac disease it produces. All schemes for the prevention of rheumatism are therefore designed with a view to minimizing the ultimate damage which the disease so often involves. There are far too many heart cripples in our midst.

The essential need for a long period of convalescence in rheumatic infection has now been recognized. Suitable care of convalescing children can reduce the total cardiac damage. But the aim must be higher still, and the very strongholds of rheu-

matic infection must be assailed. To prevent acute rheumatism in childhood is one of the new ideals of preventive medicine.

Athletics and the Heart.

Response of the Heart to Exercise.

In these days, when physical education, "youth movements" and keen competition in athletic feats are receiving so much attention throughout the world, it is opportune to review the effects of physical exertion on the heart.

How does the heart normally react to exercise? It must first be recognized that the heart and the rest of the circulatory apparatus can make rapid adjustment according to bodily requirements. Exercise demands a greater blood supply to the various muscles, and the increased activity of the heart and the dilatation of the blood vessels concerned supply the need. The rate of the heart beat is governed by a delicate balance between the sympathetic and vagus nerve supply. When exercise is taken, the sympathetic accelerator impulses are increased and the vagal inhibitory impulses reduced. In trained athletes, during mild exercise, the cardiac output is increased with but a slight acceleration of rate, the increased output being due to the greater volume at each beat. The play of equilibrium of the circulation is so wide and the reserve force of the heart so great that the tolerance to exercise is wide, and, under ordinary conditions, the heart is readily able to meet demands made upon it.

Whether exercise can lead to a pathological degree of dilatation of the heart is a question sometimes raised. Prolonged exertion, such as that undertaken by Marathon runners, provides a severe test. For running long distances the circulatory mechanism must be sound in order to provide adequate oxygen supply. The long-distance runner depends on what his respiratory and circulatory mechanism can provide during the race. Careful investigation of Marathon runners has shown no evidence of dilatation; indeed X ray examinations have often shown the hearts of the runners to be well contracted at the end of a race. The effects of short-distance races are even less important, for a sprinter can run one hundred metres without taking a single breath and, so far as the immediate needs of his muscles are concerned, he might almost dispense with his heart.

It is found that Marathon runners are usually small men with relatively large hearts, and it may be that the heart size is a question not so much of training as of inherited condition. Perhaps it is that small men with relatively large hearts are potential Marathon runners. It is of considerable interest to note in passing that the hearts of very active animals are much larger than are those of relatively inactive animals of the same size; for example, the heart of the hare is three times as heavy, relative to body weight, as that of the rabbit, while the heart of the racing greyhound is, in proportion to body size, the largest mammalian heart of all.

Heart Damage by Exercise.

Healthy men taking exercise become short of breath for a time. It is normal for exercise to be followed by fatigue effects, and also normal for exertion to be stopped before much distress occurs. There has been much discussion on the possibility of the heart being strained by undue exercise. Sir James Mackenzie used to say that dilatation never occurred from over-strain alone, and that the widely cherished belief that over-strain of the healthy heart was of frequent occurrence should be abandoned.

Physical work and exercise do not cause heart disease. They may temporarily call heavily upon the cardio-vascular reserve even in the healthy individual, or they may precipitate or aggravate symptoms and signs of heart disease already present. Much has been written about "athlete's heart", "soldier's heart" and "disorderly action of the heart" (D.A.H.). These conditions are not diseases of the heart at all; they are really a fatigue or effort syndrome, especially marked in nervous individuals, in whom it may amount to neuro-circulatory asthenia; for effort syndrome is but a part of the neurasthenic state. The basis is psychogenic, and there is usually an associated general constitutional inferiority. The condition is sometimes called "psycho-toxic heart".

In cases in which heart damage has been thought to arise from exercise, it is usually found that some accompanying circumstance has really been the cause. Some infectious disease, however slight, has preceded the physical strain. To undertake physical exercise too soon after an illness, when the heart muscle is unfit, is to invite trouble. After any acute illness, the proper care in convalescence reduces the danger of damage to the heart or circulation. It is the slight cold, the mild influenza attack, and the minor degrees of rheumatic infection that constitute a great danger, for in such cases few people realize the possibility of harm.

It is true to say, then, that participation in athletics does not predispose to heart disease; the danger can arise only if the heart damage exists already.

A Rational View of the Exercise Question.

Ordinary healthy young people can take vigorous exercise with safety and advantage, especially if proper training methods are used. Harm is likely to arise in young people only if vigorous exercise is taken when they are not physically fit. Even in young people, however, the type of exercise should be suitable to the subject; a certain amount of grading is necessary.

Some persons have better balanced circulatory machinery than others. The enthusiastic impulses of exuberant youth may sometimes require checking. After a boy has been ill, even with a mild illness, there should be no active exercise for a week or so, and even then the progress must be gradual. It is important to be sure that no unfit boy takes part in games, and instruction of the boys is necessary. At the same time, the physician must guard against

unnecessary restrictions; he must not turn the cheery boy into an anxious weakling.

Careful physical examination of athletes has become the practice in Germany. At the present time, active physiological study is being made of the whole subject of physical exercise in its relation to health.

Age considerations are also important. After the age of thirty, athletic exercise must be slower, and sports which healthy youngsters tolerate well are generally inadvisable. After thirty-five golf and the quieter forms of exercise are best. Remembering especially the liability of the heart muscle to degenerative changes, it is clear that the exercise range in older people must be limited. The danger of exercise to the hearts of young athletes has been over-rated. Yet but too little attention has been paid to the dangers that may beset the hearts of older people. Violent exercise, quite suitable when we are twenty-five, may not be so at forty-five. The dictum that life begins at forty does not apply to physical exercise. Mackenzie has said that a person with heart disease can do in safety what he can do in comfort, and the principles governing exercise in the management of sufferers from heart disease also apply to the general population. In cases in which heart disease has been thought to arise from exercise, it will usually be found, if the subject is a young person, that neurasthenia or an infection is the underlying cause; if the subject is an older person, a weakened heart muscle from degenerative changes is the basis.

Attacking the Problem.

Methods must be Adapted to the Type of Disease.

Sir George Newman, who recently retired from the post of Chief Medical Officer in the British Ministry of Health, has brilliantly reviewed the advances in preventive medicine in his book, "Health and Social Evolution". He cites the modern problems:

> The enemy to be destroyed in England is not now, as in old days, the pestilences coming whence no man knew—leprosy, plague, ague, sweating sickness, typhus and scurvy. Their place has been taken by heart disease, diseases of the lung, cancer, impairment of the nervous system, digestive disorders and tuberculosis—all of them, excepting cancer, morbid conditions intimately related to the industrial, social and personal life of the people. Of the origin of cancer we still know next to nothing, but the others we can track down and often demonstrate their social causation.

The problem of heart disease is threefold: (i) the prevention of its causes; (ii) the prevention of heart failure; and (iii) the treatment of heart failure. Only the first two aspects concern us here.

I have emphasized that the study of heart disease must be based on ætiology, and the attack must be planned from the same standpoint. The ideal of medicine is the prevention of disease, and our hope against heart disease lies in the prevention of its underlying causes. We can note, for instance, that myocarditis from diphtheria has almost gone now, for the preventive and curative management of diphtheria is so satisfactory. What can be done for other forms of heart disease?

For congenital heart disease preventive medicine can do nothing. The protection of the affected children from excessive physical strain and from infections is the only means available to prolong their lives. Their activities must be planned according to the ability of the damaged heart—the only method we have for preventing failure in any form of heart disease.

Syphilis does not play a very big part numerically in heart disease, and its effects would be reduced to vanishing point if syphilis were in all cases promptly recognized and thoroughly treated in the early stages. Unless properly treated, every person who contracts syphilis is a potential sufferer from aortic disease. Even when syphlitic cardio-vascular disease has developed, properly directed treatment may help to prolong life.

Cardiac disease from thyreoid disorder can also be prevented if the thyreoid malady is dealt with in its early stage. Even careful clinicians may occasionally overlook masked forms of hyperthyreoidism, but, once recognized, cases are amenable to operative treatment. In passing, one may note the recent use of thyreoidectomy in the treatment of heart failure from various causes.

The arterial diseases, hyperpiesia and arteriosclerosis, do not provide satisfactory opportunities for treatment. They are most frequent in occurrence and most discouraging from the point of view of control. Yet long-continued high blood pressure is not incompatible with healthy old age, and there is perhaps room for more optimism than is commonly expressed. Something can be done, moreover, by the orderly regulation of life habits. To avoid obesity, to relax more, and to lead a calmer and less strenuous life, avoiding worry—these are desirable, though not always practicable, lines of attack. The heart disease of later life cannot be expected to admit of much reduction, but education in better health habits, especially moderation in exercise and adequate rest, will give some improvement and help to render old age comfortable. The periodic examination of persons in middle life is a valuable means of detecting circulatory disorders in their early stages.

The rheumatic group of heart disease provides great opportunities. More time and energy may well be devoted to the study of the control or wiping out of rheumatic fever and its allied infections, which cripple and kill so many young people.

Since the degenerative forms of heart disease provide little opportunity for advances, it is clear that the present problem of heart disease is largely the problem of acute rheumatism. We must aim to ease the burden borne by the cardiac cripple and to prevent rheumatic heart disease from occurring at all.

Recent Research into the Problem.

Until the early years of the present century the study of diseases of the heart and circulation was

concentrated upon morbid anatomy, especially in relation to valvular disease. Then came the era of physiological interest, when acceptance was given to the idea that the functional ability of the heart was more important than its pathological anatomy. So brilliant have been the advances in knowledge of the anatomy and physiology of the heart, in radiology and in electrocardiography, that our eyes may be blind to the main problem—the ultimate cause of heart disease. We must continually think of heart disease now in terms of cause.

Throughout the world researchers are battling with the problems of the circulation with the aid of modern weapons. Experimental physiologists and pathologists have already added much to our wealth of knowledge. In England, under the ægis of the Medical Research Council, much useful work is steadily being prosecuted. Recent subjects of study have been: anginal pains in anæmia, exercise and effort angina, the effects of pregnancy and labour in heart disease, the place of surgery in heart disease, and some aspects of arteriosclerosis and high blood pressure.

The Opportunities for the Future.

There still are great opportunities for research work in bacteriological, clinical and administrative fields. The causes of rheumatism and of high blood pressure are still to be sought. There still are great opportunities for making more use of the knowledge already gained, by applying it fully in medical practice and in public health programmes. Although so big a proportion of deaths recorded as due to heart disease represents a wearing-out of the body and a general condition of senescence, yet much remains that can be improved. The main methods of attack are:

(*a*) Early detection of causes leading to cardiac disease, especially the mild forms of rheumatic fever. Prompt and thorough treatment of syphilis and of thyreoid disorders.

(*b*) Early detection of existing cardiac disease. School medical examinations, life insurance examinations, examinations for employment and periodic health examinations may all play an important part.

(*c*) The management of individual sufferers. This is a matter for individual care and not for mass-production methods. Each patient presents a special problem. The manner of his life, the amount and nature of the exercise he should take, can be gauged only from the careful study of the patient as a whole.

(*d*) Clinical research by practising physicians. The brilliant work of Mackenzie showed what great opportunities exist; for it was during his years of work as a general physician in a large industrial centre in England that he laid the basis of his monumental work on diseases of the heart. By his careful observation of the course of the illness and the subsequent complications, the practising physician may add much to our knowledge of heart disease.

(*e*) The education of the general public. The importance of rheumatic fever and of syphilis as causes of heart disease needs continual emphasis. The care and regulation of life needed in persons suffering from diseases of the heart must be recognized. The periodic health examination—an annual stocktaking of personal health—is as important to the individual as the annual balance sheet is to the business man. People should seek the advice and guidance of the physician at regular intervals while they are reasonably well, and not only when actual illness assails them. Only with the full cooperation of the whole community can preventive medicine achieve its aims. The day will surely come when for every citizen there will be a health dossier, a ledger account of his health statistics from the cradle to the grave. Detailed records of the health of every soldier are made in time of war and are of untold value; the health history of the ordinary citizen of the future will be similarly docketed in times of peace.

(*f*) Hospitals: statistics and special clinics. Careful records of admission rates of various types of rheumatic infection and of heart disease are extremely valuable, but, unless the greatest care is taken in classifying and in compiling the statistics, the results may be valueless. Special cardiac clinics for the follow-up of heart cases are valuable. It must be recognized that supervision in many cases must be life-long. Almoners on the staffs of hospitals are of great assistance in studying and regulating the home environment of rheumatic sufferers.

(*g*) Statistical departments: accuracy and type of mortality records. The information to be derived from death statistics is dependent on the accuracy of certification by attending physicians. I have shown in reviewing the statistical aspects of heart disease how fashion in certification may modify statistical data. It frequently happens that the diagnosis of "heart disease" is entered on death certificates on very slender evidence. The method of tabulation of heart disease at present in use is not in accord with the well-established advances in clinical medicine. The "International List of Causes of Death", which was designed to achieve uniformity in vital statistics throughout the world, does not provide for the classification of heart disease in ætiological groups. Possibly in the next decennial revision, due in 1940, this desirable amendment might be considered. If heart disease mortality could be viewed from the ætiological basis, the statistical returns would be more nearly accurate and infinitely more useful to the researcher.

Probably the greatest difficulty for the statistician occurs when more than one cause of death is entered on the certificate. Even "The Manual of Joint Causes", the guide-book of the statistician, gives many rulings which are purely arbitrary. Chronic nephritis, for instance, takes precedence over heart disease; and if a person died from rheumatic heart disease or subacute bacterial endo-

carditis complicated by nephritis, the death would figure in the statistics as being due to nephritis.

Obviously the statistician's task is hard. He cannot please everybody. A death from "syphilis: aortic valvular disease" is entered under "syphilis". This may suit the inquiring expert in venereal diseases, but the cardiologist gets no information that a death from heart disease has occurred. Each death can be recorded under only one heading, and there seems no easy way out. A scheme to suit the cardiologist may perhaps suit nobody else. Verily, the path of research into mortality statistics is profusely strewn with thorns.

(*h*) Health departments: records and supervisory arrangements. The compulsory notification of rheumatic fever does not appear warranted. The provision and control of suitable institutions, such as convalescent homes and hospital schools, is desirable in every community. These arrangements often come under the care of health departments. A great opportunity exists for proper care of heart-crippled patients and for research work into the nature of their ills. Cardiac cripples comprise a very large group of the physically handicapped, and health departments should take an active part in providing for their comfort, physical and mental training, and general supervision. The rheumatism supervisory clinics, as organized in England, are capable of excellent work in this direction; a beginning on similar lines has been made in some of our Australian cities, but there is crying need for rapid and wide extension.

(*i*) Education departments: propaganda in general hygiene, and the education of heart cripples. The schools provide the best channel for instilling health information into the general community; today's children are tomorrow's citizens. The physical education of children handicapped by heart disabilities demands special care, and the exercises must be adapted to the patient's ability to perform them. Special plans are necessary too, for the education of children suffering from heart disease, but, since communities differ greatly, various and flexible methods are necessary. A desirable plan is developing in New South Wales, where the Education Department recently agreed to keep a register of all school children who have had rheumatic fever, and to collect all relevant data. The cooperation of the child, the physician, the parent and the teacher can achieve a great deal.

The Outlook.

The outlook for the sufferer from cardiac disease is not as gloomy as formerly. Grant, in England, made a careful study of 1,000 cardiac cases over a period of ten years, and he found that 51% of these patients were still alive at the end of that time, and that most of them were able to undertake some degree of physical activity.

In all fields public health has made great advances. René Sand has estimated that for one person who dies from an infectious disease in New Zealand at the present day, 66 died in London 250 years ago, and that for one person who now dies from tuberculosis in New Zealand, more than 30 died in London 250 years ago.

Great advances have been made. The scientific study of disease and all its complications has effected a tremendous improvement. There is still much to be done. Research must be continued and the knowledge gained must be applied; there must be no weakening of effort.

The Government of the Commonwealth of Australia, with the cooperation of the State governments, has recently formed a National Health and Medical Research Council. To the attention of such a body would I earnestly commend the problems we have been considering today. In prevention lies the trend of progressive medicine. The modern physician has become concerned with diphtheria immunization, with antenatal care, and with baby welfare schemes. To retain a high standard of health in the community is a nobler aim than to cure its diseases. Diseases of the heart weigh heavily upon us. To prevent them when he can, and to alleviate suffering when preventive methods fail, here surely can the physician, "the flower of our civilization", earn a laurel crown.

ANXIETY AND THE HEART: WITH AN ANALYSIS OF CASES.[1]

By R. Whishaw, M.B., Ch.M., M.R.C.P. (London),
Physician to the Hobart Public Hospital.

Patients frequently present themselves with anxieties as to whether or not heart disease is present. If their hearts are found to be healthy, simple reassurance may be all that is required. Hypochondriasis and hysteria may assume a cardiac phase and require the assistance of a psychiatrist to unravel the complex. I wish to discuss, however, the more common effects of anxiety on the so-called "sympathetico-tonic" individual. This often leads to the well known anxiety neurosis, with which we are all familiar. In certain cases, however, the symptoms are suggestive of heart disease, not only to the patient himself, but also to his doctor.

If a diagnosis of heart disease is made when it is not present, I think that more harm is done than when a diseased heart is pronounced to be healthy. The reason is that the former mistake most often occurs in younger people, and the result may be, and often is, life-long incapacity. I have come across several of these unfortunates lately, and have collected for review thirty such patients seen in private practice during the last six months.

The cases to which I refer are common and important, and the syndrome goes by various names—

[1] Read at a meeting of the Tasmanian Branch of the British Medical Association on December 8, 1936.

neuro-circulatory asthenia, autonomic imbalance, phrenocardia, effort syndrome, disordered action of the heart, neurotic tachycardia, irritable heart, cardiac neurosis, and the French term, *le trépied*.

The point is, that the heart is not diseased, and the syndrome is a functional nervous disease, very closely related to the condition known as anxiety neurosis. If seen and recognized in an early stage it may be cured by simple means.

The late War brought thousands of these cases to the fore, the reason being obvious. The types met with in civil practice are essentially the same, though they run a less acute course.

In order to make clear the type of case I am attempting to describe it will perhaps be more useful to discuss the symptomatology before the ætiology, beginning with a synopsis of one of my cases.

Miss X, aged thirty-two years, a trained nurse, had always been of a nervous disposition, but had been in good health until nine months ago. At that time, while attempting to lift a helpless patient, she was conscious of a pain in the left side of her chest; shortly afterwards she became breathless and exhausted. Several doctors confirmed her own conviction that she had strained her heart. Ever since then she has been unable to work on account of rapid heart action, of which she was painfully conscious, and which kept her from sleep. She also suffered from submammary pain, which was constantly present, and which was not related to exertion or to meals. She stated that she was short of breath; this was aggravated by exertion or emotion, and she had occasional attacks of giddiness. She was nervous and irritable, and noticed that her skin became moist for little or no reason.

On examination the nervousness was well marked, and the resting pulse rate was 96 per minute. On mild exertion it rose to 110, and her respiratory rate was unduly hurried, both taking several minutes to regain the former level. The heart was normal; her systolic blood pressure was 150 millimetres of mercury, falling to 130; the diastolic pressure was 90 millimetres of mercury. The thyreoid was not palpable. Nothing abnormal was found otherwise on examination, and an electrocardiograph was normal.

Symptomatology.

These people, I think, are invariably of a supersensitive temperament—over anxious, over conscientious, the worrying type that every doctor knows so well. They are the type that seem to be looking for trouble and yet are excellent citizens. For some time before the breakdown the patient may be more nervous and anxious than usual, "thoroughly run down" as he describes it, and then a precipitating factor which to a phlegmatic person might be of little moment sets up the definite symptom complex.

Palpitation and fatigue are the main complaints. Exertion, even trivial, causes exhaustion and aggravates the tachycardia, and may bring on a feeling of breathlessness and precordial discomfort. These symptoms are aggravated by excitement and fatigue, as well as exertion, but often gentle exercise relieves them. All grades of severity of the above are met with, and, in the more severe types, dizziness and faintness on slight exertion may be added. The breathlessness is often more subjective than objective, and complaints of sighing—the sensation that a deep breath must be taken—are characteristic. Respiration is often irregular and incoordinated.

It is the combination of the sighing type of respiration with palpitation and submammary pain that Gallavardin calls *le trépied*. No doubt you are familiar with this sighing respiration. "Difficulty in getting a really good breath" as the patient sometimes describes it. He may mistake this for shortness of breath, but, actually, ventilation of the lungs is normal. The condition occurs at rest. In one interesting case that I observed (not included in this series) the sensation that excessively deep breaths must be taken was so strong that overventilation occurred, with consequent tetany.

The explanation of the latter was that tetany caused excessive loss of carbon dioxide in the breath, resulting in alkalosis. The amount of calcium carried in the blood in ionic form was thus decreased, even though the blood calcium was normal.

Palpitation is defined as the consciousness of the heart beat. Taking palpitation as the presenting symptom, Doris Baker, in an analysis of 1,004 patients, found that 45·4% were free from organic heart disease. The remainder suffered chiefly from thyreotoxicosis, paroxysmal tachycardia and hypertension.

The heart may often beat forcibly, and this may be described by the patient as palpitation. There is often a slight tremor, and vasomotor instability causing flushing and moist cold hands and feet may be present. The submammary pain is characterized by the situation, the gradual onset and the duration, which, with intermissions, may last for weeks or months. It is either sharp and shooting or dull and aching, and has no direct relation to exertion.

On examination the symptoms are usually exaggerated, the pulse rate is rapid, and the forcible apex impulse is more diffuse than usual, giving a false impression of enlargement of the heart. This impression is increased by the thin chest wall (these people are commonly underweight) and a possible systolic murmur. The murmur is often of the cardio-respiratory type, or a systolic murmur may be heard at the apex or base, and is usually soft. The systolic blood pressure is unstable and often raised. There is sometimes precordial tenderness. I have noted a slight afternoon rise of temperature occasionally, for which no cause can be found. The thyreoid may be palpable. Exercise tests increase the pulse rate and respiration rate, which take longer than usual to settle again. Vital capacity is reduced considerably. The basal metabolic rate may be very slightly raised, but is well within normal limits. It is often difficult to get these people into a satisfactory "basal state", the test having to be repeated many times.

There are no characteristic changes in the electrocardiograph. X ray screening confirms the clinical finding of a normal sized heart; it is frequently of the long, narrow, "vertical" type that one finds in thin people with low diaphragms.

Ætiology.

There is a small important group in which toxæmia is present. This may be due to early pulmonary tuberculosis; to infection of the paranasal sinuses, bowel or kidney; or to convalescence after infectious fevers, such as influenza and pneumonia, and also early thyreotoxicosis. In the vast majority of cases, however, no such cause can be found, and I think there is little doubt that anxiety is the causal agent.

The syndrome, then, is caused by the effects of anxiety on a definite type of temperament, that is, the over-anxious worrying type.

In my series the syndrome occurred in 10% of all patients exhibiting symptoms or signs of heart disease, and this figure agrees with much larger series, such as that of White and Jones (1933).

Heredity is important is this regard, the inherent nervous instability of the victim having been handed on. Frequently in his own past history evidence of nervous instability is not hard to find, usually in the form of nervous breakdowns at times of stress. Females are rather more liable than males, and most cases occur in persons between the ages of twenty and forty years. The mental conflicts are sometimes pathetically evident during history taking; at others they are suppressed and forgotten, and the secondary anxiety with regard to the heart maintains the tachycardia.

Most authorities hold that few, if any, of these people develop thyreotoxicosis later.

If we assume, then, that this syndrome is essentially a type of anxiety neurosis, we look to the psychologists for an explanation of the mechanism. They tell us that there is invariably an underlying disturbance of the sexual function; and it is certainly common knowledge that individuals exhibiting this type of temperament frequently have unhealthy ideas as to sex problems. It is not in my province to delve into this aspect of the subject; it is sufficient to say that the inhibitions set up a strong excitation of the sympathetic system, which leads either to an anxiety state or to the symptom complex that we are discussing.

The exciting cause may be due to sickness in the family, a row with the boss, a febrile attack, or a major operation, and so on. This may lead to what Walter Misch describes as the "major anxiety attack". In my cases notable exciting causes were: marital infidelity; accidents, especially those in which it was thought that the heart had been strained; and surgical operations. The patient and his family are quite unaware of the effect of these occurrences on his health, or if he does consider them as possible causes, he puts quite the wrong interpretation on them.

The major attack may not occur at all; but if it does, it consists of vaso-constriction in the skin (causing paræsthesiæ, cold sensations and pallor), tachycardia, cold sweating, inhibition of saliva (dry mouth) and relaxation of the voluntary muscular system. Identical symptoms occur in a normal person as the result of a severe fright, but these sensitive people react to less intense psychical stimuli. The symptoms are due to strong stimulation of the sympathetic by the adrenals. It is interesting to note that recently it has been discovered that an injection of acetylcholine will abort such an attack at this stage, the drug stimulating the parasympathetic system. When the syndrome has been in existence any length of time other psychological factors come into play and the treatment is not so simple.

It is most important to remember that these people are very suggestible and the doctor's words at the first interview may often cure them or damn them to chronic invalidism.

Diagnosis.

This condition is more often mistaken for cardiac disease than any other. Palpitation, one of the commonest complaints, is a vague term, and includes premature beats, paroxysmal tachycardia, auricular fibrillation, and commonly, forcible heart action. Perhaps the patients usually mean tachycardia when they speak of palpitation. A tachycardia which does not begin or end suddenly, which varies in rate, and which is not due to organic heart disease, toxæmias (such as early phthisis) or to thyreotoxicosis, is of sympathetic origin.

Organic heart disease is first excluded by the absence of cardiac enlargement and murmurs (usually diastolic in time), venous engorgement, œdema and so on. A full physical examination is necessary to exclude toxæmias from any cause, and, indeed, this is an important part of the treatment. A skiagram of the chest is useful, not only to rule out disease of the lungs, but to confirm the absence of enlargement of the heart.

The increased pulse rate, often accompanied by slight tremor, nervousness and vasomotor phenomena, and perhaps also a palpable thyreoid, suggests hyperthyreoidism, and it is here that I have found the most difficulty. When either disease is well developed this difficulty is not encountered; it is in the mild forms and in the early stages, when a definite opinion is so important, that the difficulty lies. Estimation of the basal metabolic rate is a great help, for I believe that in few cases, even of mild hyperthyreoidism, have the patients a normal basal metabolic rate. Preparation of these patients for the test also gives useful information. In the functional cases there is greater variation in pulse rate; but with gentle handling, rest and quiet it generally settles down to lower levels. The patients' breathing is often irregular and incoordinated, and it is often necessary to carry out the test on four or five occasions before the estimation is satisfactorily obtained. It is usually much easier to obtain a satisfactory straight base line on the kymograph of the Benedict basal metabolic rate apparatus in thyreotoxicosis. I think that this is often of diagnostic importance.

The iodine test is useful in differentiating between the two diseases. In the former, eight to ten days' treatment with 4·0 cubic centimetres (sixty minims

of Lugol's iodine daily will almost invariably bring about some improvement in the symptoms, and will give a lower reading of the basal metabolic rate (Robertson), but in the latter there will be no change.

If it is possible to induce respiratory sinus arrhythmia during tachycardia, it is more likely that the tachycardia is of nervous origin. The cases that complicate heart disease (about 2%) are difficult, but their recognition is perhaps of lesser importance. Exercise tolerance tests and estimation of vital capacity show reduction, but are of little help in diagnosis. In thyreotoxicosis a slight stare is often an early sign. Also a puffy pouched condition of the lower eyelids. Pigmentation of the skin and osteoporosis, as shown in skiagrams of the long bones, are signs which may help in the differential diagnosis.

Angina pectoris is not infrequently simulated. I have seen several patients whose main complaint has been pain in the chest, but careful consideration of the history will usually eliminate this disease. The pain is seldom severe, it is usually submammary, and is either of a dull, aching variety, or stabbing in character. It seldom radiates, and the relation to exertion is indefinite; it is not paroxysmal. It has to be remembered, however, that angina of effort does occur in people of this type of temperament, and in about 20% of cases no sign of organic disease of the heart can be demonstrated.

Treatment.

I wish to make a special plea for the early recognition and correct treatment of patients with this condition.

The established condition is very difficult to cure, whereas in the initial stages wise handling will nearly always be successful. In the first instance a careful history and complete physical examination are essential. This is followed by any special examination that may be indicated, such as X ray examination of the chest, an estimation of the basal metabolic rate, and the taking of an electrocardiographic tracing. A diagnosis having been made, the patient is thoroughly reassured as to his heart being healthy. A simple explanation should follow, for it is imperative that his anxiety be dispelled. If he is told there is nothing wrong, he will be in just as sad a plight as before the examination. In the words of Ester L. Richardson, it does no good to tell such a palpitating person that his heart is sound and then to give him a bottle of medicine and to tell him to go slowly, to rest as much as possible or to take a trip somewhere. The explanation must show him that his symptoms represent emotional states. The next step is to discuss with him the ætiological factor in his anxiety, the situational background which has been brought out in the history. If a sexual disturbance is found, some helpful advice or explanation may be useful. It is wise to make the final explanation of symptoms in the presence of a member of the family in order to secure their cooperation.

These explanations may make the patient feel ashamed, but it is important to put him at his ease, and to point out that anyone, under situations of discomfort, is conscious of his body protesting, in palpitation, sweating, shortness of breath and nausea. This (also in Ester Richardson's words) "desensitizes him to scare", and allows him to accept his symptoms as natural biological processes.

Actually the best educational process is to send him straight back to the source of his anxiety, warning him that he will feel wretchedly apprehensive, but that if he will stick it out he will cure his fear, and that he alone can do the trick. Less drastic treatment is perhaps wiser, except in the mildest cases, namely, graduated exercise combined with a fresh interest, such as a new hobby, when possible, and cheerful company. This ideal is seldom attainable, but a great deal can be done by the physician's constant encouragement, persuasion and suggestion. If a patient asks if he may indulge in sport he should not be warned that it is too strenuous, but told that he may do as he pleases, and that if he overtires himself no serious harm will result. Any obvious bad habit must be stopped, for example, excessive smoking; and a septic focus may have to be treated. For giddiness an abdominal belt is useful. Drugs have a small place in the treatment, but may be required to secure sleep. Mild sedatives in the early stages are useful, and may be combined with a bitter if the appetite is poor, but they should be soon given up.

Finally, I have drawn up a synopsis of my cases in the form of a table. The comments I wish to make on this table are briefly as follow:

1. There are sixteen females and fourteen males in the series.

2. The average age is thirty-five years.

3. The incidence represents 10% of all patients exhibiting cardiac symptoms or signs in private practice.

4. In two cases the syndrome complicated organic heart disease (hypertensive heart disease). Mild hypertension was not uncommon.

5. Sixteen patients (53%) had been told that their hearts were diseased.

6. In twelve cases domestic troubles were the exciting cause. Nine cases followed surgical operation or illness. Five cases followed war neuroses. Four cases followed accidents (including muscular strains).

7. All patients complained of symptoms referable to the heart, which was found normal in all but two cases.

8. In all cases anxiety was present and appeared to be the exciting factor.

9. In the cases in which the basal metabolic rate was estimated it was found to be normal.

10. Two patients had had their thyreoids removed with disastrous results.

11. No distinctive electrocardiographic changes were found.

SYNOPSIS AND ANALYSIS OF CASES.

Case Number.	Sex.	Age.	Occupation.	Length of History.	Ætiological Factor.	Symptoms.	Signs. (Unless otherwise stated, the heart was normal on Examination.)	Blood Pressure in Millimetres of Mercury.	Electrocardiogram.	Basal Metabolic Rate.	X Ray Examination of Chest.
I	M.	32	Orchardist.	9 months.	Appendix operation.	Exhaustion, breathlessness, palpitation, precordial ache.	Thin, nervous, moist skin. Systolic murmur. No enlargement.	135/90	Normal.	+7	Normal.
II	F.	46	Housewife.	5 years.	Pyelitis.	Palpitation, exhaustion, short breath.	Pulse 90 to 60. Tremor.	170/100	High voltage *T* 3 inverted.	−16	
III	F.	28	Housewife.	4 months.	Pelvic operation and infidelity of husband.	Nervousness, palpitation, breathlessness, chest pains.	Pulse 100. Tremor. Thyreoid palpable.	160/100	High voltage all leads.		
IV	F.	27	Shop Assistant.	3 years.	Illness and deaths in family. Thyreoid removed without benefit.	Palpitation and nervousness.	Pulse 72. Soft, apical, systolic.	140/90	Normal.	+3	Normal.
V	F.	35	Housewife.	2 years.	Sex factor.	Attacks of faintness and suffocation, with palpitation.	Pulse 112. Thin and nervous.	140/85			
VI	F.	49	Nil.	3 years.	Not ascertained, wants pension, climacteric.	Fluttering of heart, tightness of throat, pain in chest, giddiness.	Pulse 88. Obesity.	140/90			
VII	F.	38	Nurse.	3 months.	Motor accident.	Palpitation, submammary pain, exhaustion.	Pulse 100 to 88. temperature 37·2° C. (99° F.). Thyreoid palpable, nervous, thin.	140/90	Inverted *QRS* and *T* in Lead III.	+2	Normal.
VIII	M.	38	Orchardist.	9 months.	House and everything lost in fire.	Thumping of heart, precordial oppression and nervousness.	Pulse 100. Thin and nervous.	140/90	Normal.		
IX	F.	26	Nurse.	6 months.	Tonsil operation.	Exhaustion, palpitation, depression and nervousness.	Pulse 100. Thin and nervous. Thyreoid palpable.	140/80		−5	Normal.
X	F.	13	Schoolgirl.	5 weeks.	Fell off pony and suffered mild concussion.	Palpitation and nervousness.	Pulse 140. Soft systolic murmur over pulmonary area.	130/80			
XI	M.	36	Orchardist.	4 years.	Since operation for goitre.	Palpitation, weak, nervousness, short of breath.	Pulse 56. Thin and nervous.	130/80	Sinus bradycardia, low voltage in Lead I.	−10	Normal.
XII	F.	45	Housewife.	4 years.	Domestic trouble and infidelity.	Palpitation, precordial ache, nervousness and sweating.	Pulse 120. Moist skin, obese.	150/90			
XIII	F.	32	Nurse.	9 months.	Strained her heart lifting a patient.	Palpitation, nervousness, precordial pain, breathlessness, slight giddiness.	Pulse 96. Nervous, irritable.	150/100	Normal.		
XIV	M.	20	Labourer.	8 months.	Thought strained heart lifting.	Palpitation, precordial pain nervousness.	Pulse 100, with premature beats, thin.	135/85	Occasional premature ventricular beats. Low voltage Lead III. *T* 3 inverted.	+8	Normal.

SYNOPSIS AND ANALYSIS OF CASES.—*Continued.*

Case Number.	Sex.	Age.	Occupation.	Length of History.	Ætiological Factor.	Symptoms.	Signs. (Unless otherwise stated, the heart was normal on Examination.)	Blood Pressure in Millimetres of Mercury.	Electrocardiogram.	Basal Metabolic Rate.	X Ray Examination of Chest.
XV	M.	28	Labourer.	6 months.	Accident, lifting; thought strained heart.	Pain in chest, shortness of breath.	Pulse 96. Nervous, Thyreoid palpable.	180/110 (falling).	*T* 3 inverted.		
XVI	F.	45	Nurse.	6 months.	Anxiety over mother's health.	Rapid heart on exertion, with shortness of breath.	Pulse 100. Nervous.	150/90		+6	Normal.
XVII	F.	45	Housewife.	3 weeks.	Attack of indigestion, with palpitation, and phobia of heart disease.	Palpitation, breathlessness, with sighing.	Pulse 80. Nervous and apprehensive (after long test).	160/90			
XVIII	M.	36	Orchardist.	2 months.	Anxiety over inability to pay rent on home.	Exhaustion, palpitation, chest pains, nervous and breathless.	Pulse 120. Thyreoid palpable, nervous.	150/100	*Q* 3 + *T* 3, biphasic.	+9	Normal.
XIX	M.	42	Returned Soldier.	10 years.	Shell shock.	Palpitation, giddiness, bad heads, breathlessness.	Pulse 100. Thyreoid palpable.	140/100	Normal.		Normal.
XX	M.	2	Priest.	Few weeks.	Spat speck of blood, and some doubt in X ray findings on examination of heart.	Palpitation, uneasy feeling in chest, shortness of breath, and and nervous.	Pulse 88. Nervous.	130/70	Sinus arrhythmia, *QRS* 1, low voltage, *T* 1 inverted, *T* 3+.		Normal. Slight apparent enlargement due to scoliosis.
XXI	F.	17	Nil.	9 weeks.	Post scarlatinal nephritis. Completely cleared up.	Rapid heart and exhaustion.	Pulse 120. Nervous.	140/80	Sinus arrhythmia, sinus tachycardia. *T* 2 flat, *T* 3 inverted.		
XXII	F.	51	Housewife.	Several years.	Domestic worry.	Palpitation, giddiness, shortness of breath, and chest ache.	Pulse 80. Soft systolic at base.	135/85			
XXIII	M.	43	Returned soldier.	15 months (relapse).	War neurosis.	Soreness over heart and depression, palpitation, shortness of breath, with sighing.	Pulse 70. Tenderness over precordium, nervous.	120/80	Low voltage in Lead I.		Normal.
XXIV	F.	55	Author (Widow).	Several years.	Anxiety over domestic matters.	Palpitation and nervousness, flushes.	Pulse 100. Flushed and excitable. Heart enlarged.	260/130			Left ventricle + hypertensive heart disease.
XXV	M.	25	Storekeeper.	6 months.	Anxiety over business.	Precordial ache, and breathlessness and palpitation.	Pulse 140–120. Thyreoid palpable. Heart enlarged slightly.	200/100. Later 160/100	Left axis deviation. *S* 2, *S* 3 + *T* 3 flat.	+5	Hypertensive heart disease.
XXVI	F.	25	Housewife.	6 months.	Told had heart disease.	Precordial ache and breathlessness.	Pulse 100. Nervous and thin type.	140/90	*T* 3 flat.		
XXVII	M.	36	Returned Soldier.	8 years.	War neurosis.	Stabbing pain over heart, short breath and giddy.	Pulse 96. Obese, nervous.	130/90	Low voltage in Lead III. *T* 3 inverted.		Horizontal type of heart.

SYNOPSIS AND ANALYSIS OF CASES.—*Continued.*

Case Number.	Sex.	Age.	Occupation.	Length of History.	Ætiological Factor.	Symptoms.	Signs. (Unless otherwise stated, the heart was normal on Examination.)	Blood Pressure in Millimetres of Mercury.	Electrocardiogram.	Basal Metabolic Rate.	X Ray Examination of Chest.
XXVIII	M.	42	Returned Soldier.	Since war.	War neurosis.	Palpitation, shortness of breath, nervous apprehension, exhaustion.	Pulse 120. Forcible heart action, cold, moist, tremulous hands.	150/100	Sinus tachycardia. Occasional ventricular compensated premature beats.		Normal.
XXIX	M.	47	Priest.	6 years.	Following nephrosis.	Sighing respiration, breathlessness, exhaustion, palpitation, giddiness.	Pulse 85. Nervous. Nil. Kidney function now normal.	140/100	Left axis deviation.		Normal.
XXX	M.	40	Returned Soldier.	Since war.	War neurosis.	Sighing respiration, shortness of breath, palpitation.	Pulse 85 (varies). nervous, moist hands.	140/90	Sinus arrhythmia.		Normal.

Too short a time has elapsed to estimate the final results of treatment in all cases, but it was obvious that the shorter the history, the better were the results. Nine patients were seen only in consultation and were not traced. Thirteen patients were much relieved, and five were cured. Three remained unrelieved, and it is significant that two of these had had their thyreoids removed.

BLOOD TRANSFUSION: A CLOSED METHOD OF COLLECTION AND ADMINISTRATION.

By W. HUGH MILROY, M.B., B.S. (Melbourne),
Resident Medical Officer, Royal Melbourne Hospital,

AND

A. D. MATHESON, M.B., B.S. (Melbourne),
Resident Medical Officer, Royal Melbourne Hospital.

THE prevention of external contamination of the blood and the exclusion of foreign particles from the blood stream are two essentials in the technique of blood transfusion. Bacterial contamination is particularly liable to occur when blood is poured from one container to another; therefore a closed method is preferable, as it excludes this danger. Filtration of the citrated blood is also desirable, in order to prevent any foreign particles, usually small clots, from entering the blood stream of the recipient.

An apparatus is described combining these two features. The principles are not new, having been used by Stokes,[1] McCartney,[2] Marriott and Kekwick,[3] and others. But, as far as we know, our combination of these has not been previously recorded. In addition, the apparatus has been used successfully for filling the continuous drip blood transfusion apparatus described originally by Marriott and Kekwick[4] and modified by Wood.[5]

Apparatus.

The apparatus (Figure I) consists of a graduated Erlenmeyer flask of 1,500 cubic centimetres (fifty ounces) capacity, closed with a three-bore rubber stopper. Through one hole passes the stem of a

FIGURE I.
Apparatus as assembled for collecting blood. *A*: glass tubing with reversed Higginson's syringe attached; *B*: glass tubing with rubber tubing and collecting needle attached; *F*: rubber cap; *T*: thistle funnel.

thistle funnel, *T* (Figures I and II) (4·7 millimetres bore and 1·5 millimetres wall thickness),[1] bent as in Figure I. The thistle funnel is bent as

[1] The gauge of both rubber and glass tubing used throughout the apparatus is standardized to these measurements.

shown so that the non-citrated blood entering the flask falls straight into the citrate without splashing on the bulb of the thistle funnel. Over the bulb of the thistle funnel are stretched two layers of best quality fine gauze secured by a tape tied around the groove. New gauze and tape are used after each transfusion. Through the other two holes in the stopper pass two glass tubes, *A* and *B* (Figure I), bent at right angles, and projecting about 2·5 centimetres inside the flask. To one of these, *A*, is connected a reversed Higginson's syringe (for suction). The other glass tubing, *B*, is connected to a large bore collecting needle by means of ribbed rubber tubing about 15·0 centimetres in length.

When the blood is being administered, the flask rests in a shallow metal pan, *D* (Figure II), to the

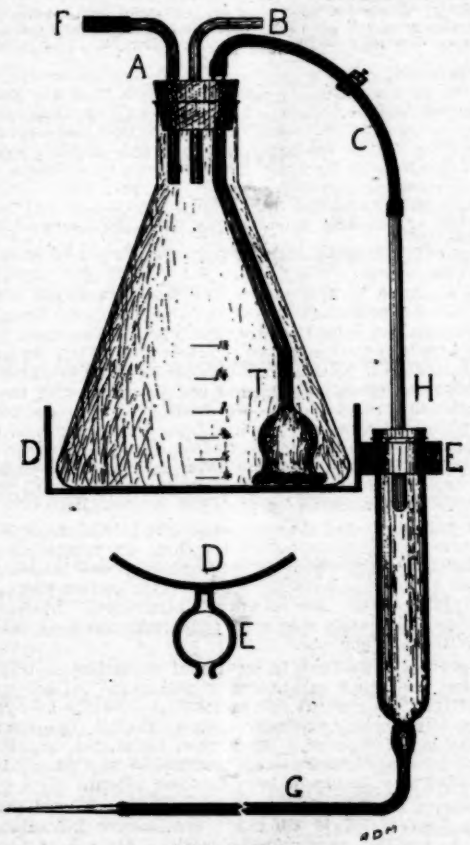

FIGURE II.

Same apparatus as assembled for the administration of blood. *A* and *B*: glass tubes through rubber stopper; *C*: rubber tubing from thistle funnel to dropper; *D*: shallow metal pan; *E*: metal spring clip; *F*: rubber cap on tubing *A*; *G*: rubber tubing from dropper to cannula; *H*: rubber stopper with glass tubing in position; *T*: thistle funnel.

outside of which is attached a metal spring clip, *E* (Figure II), to hold the dropper. This dropper consists of the barrel of an ordinary male urethral syringe fitted with a rubber stopper, *H* (Figure II), through which passes a piece of glass tubing, 10·0 centimetres in length, connected to the thistle funnel, *T* (Figure II), by ribbed rubber tubing. A screw clip is attached between the flask and the dropper to control the rate of flow of blood. From the lower end of the dropper, rubber tubing, *G* (Figure II), about 85·0 centimetres in length, leads to a glass cannula, Kaufmann's syringe, or a three-way tube connected to a "Record" syringe and needle.

Ribbed rubber tubing is used throughout, as it withstands sterilization very well and gives flexibility without a tendency to kink.

Cleansing and Sterilization of Apparatus.

Immediately after use the apparatus is completely disconnected, washed thoroughly in tap-water, and finally rinsed in distilled water. New gauze and tape are fixed in position when the apparatus has been dried. The pan is boiled and the remainder autoclaved in two bundles: (i) Higginson's syringe, flask and stopper with tubing already assembled, also a small cap, *F* (Figure I), which fits over the stem of the thistle funnel while the blood is being collected. (This cap consists of rubber tubing, 2·5 centimetres in length, with a small piece of solid glass rod inserted to close one end.) (ii) The dropper, rubber tubing, *C* and *G* (Figure II), and cannula.

Method of Collecting the Blood.

The apparatus from number 1 bundle is assembled as in Figure I. Before blood is collected, the thistle funnel should be adjusted so that the gauze is just touching the bottom of the flask when the stopper is in position. With the cuff of a sphygmomanometer around the donor's arm at a pressure of approximately 60 millimetres of mercury, a suitable vein is chosen, the overlying skin is prepared with antiseptic, and a small quantity of local anæsthetic is injected into the skin over the vein. Sterile sodium citrate solution (50 cubic centimetres of 3·8% for one pint of blood) is drawn through the collecting needle by means of the reversed Higginson's syringe. The needle is then introduced into the donor's vein. With the flask at a lower level than the donor's arm, blood is drawn into the flask with the aid of negative pressure produced by the Higginson's syringe, while the flask is gently rocked to ensure adequate mixing of the blood with the citrate. After the required quantity of blood has been collected, the manometer pressure is released and the needle is withdrawn; a small quantity of sodium citrate is immediately sucked through the needle to prevent the clotting of non-citrated blood remaining in the tubing.

Administration of Blood.

The collecting needle and Higginson's syringe are disconnected, the latter is replaced by the rubber cap, which is removed from the end of the thistle funnel. The flask is placed in the pan and the contents of number 2 bundle are assembled. The dropper, rubber tubing, *G* (Figure II), and cannula are filled with normal saline or 5% glucose and saline solution, and all air bubbles are excluded. The

dropper is then placed in position so that it is held by the metal clip, *E* (Figure II). The appropriate needle or cannula is then inserted into the recipient's vein. When the saline solution is running freely into the vein, the stopper, *H* (Figure II), is pushed into position so that the system becomes air-tight. As the saline solution flows into the vein, blood is drawn by suction up the thistle funnel and then down into the dropper. By the time the blood is flowing into the dropper, the level of the saline solution has fallen about 2·5 centimetres. Care must taken that the stopper, *H* (Figure II), makes an air-tight connexion, otherwise the blood will not siphon. The rate of flow can be regulated by: (i) alteration of the height of the pan above the vein, (ii) adjusting the clip on the rubber tubing, *C* (Figure II).

For a satisfactory flow of blood the pan is usually about 60 centimetres above the patient's vein, and rests on a stand or pedestal. If it is desired to maintain the blood at a constant temperature, a deeper and wider pan can be used, and water at a temperature not greater than 40·5° C. (105° F.) can be placed around the flask. A pint of blood can be administered in approximately thirty minutes from the time of taking. Should more than sixty minutes elapse following the collecting of the blood, sedimentation is liable to occur. This might arise if the blood were administered during an operation, and it is essential in this case that the flask be gently agitated from time to time.

Method of Filling the Continuous Drip Blood Transfusion Apparatus.

Filling the reservoir of the continuous apparatus described by Wood[5] may be carried out easily and quickly by utilizing gentle oxygen pressure to force the blood from the flask (Figure I) into the reservoir of the continuous apparatus. Sterile rubber tubing is connected from the stem of the thistle funnel to the filling tube of the reservoir, the rubber cap, *F* (Figure I), having first been changed to the glass tubing, *A* (Figure I). Similar rubber tubing connects the oxygen cylinder to the glass tubing, *B* (Figure I) an oxygen filter being interposed. A very small flow of oxygen is used and the blood is slowly displaced from the flask to the reservoir.

Summary.

An apparatus for the administration of citrated blood has been described, which has the following advantages:

1. It is simple, inexpensive and easily constructed.
2. The blood is protected from contamination throughout.
3. The citrated blood is filtered.
4. It can be used in the theatre during operations, as it is compact and self-operating and therefore causes no inconvenience to the surgeon, especially as leg veins can be used.
5. The same apparatus can be used for straight blood transfusions or filling the reservoir of a continuous drip blood transfusion apparatus.

Acknowledgements.

We wish to express our sincere thanks to the honorary staff of the Royal Melbourne Hospital for their help and encouragement, and to Dr. Ian Wood and the medical superintendent, Dr. J. H. Bolton, for their suggestions.

References.

(1) E. H. Stokes: "Blood Transfusion: An Apparatus for Transfusion of Citrated Blood", The Medical Journal of Australia, December 17, 1932, page 746.

(2) J. E. McCartney: "Improved Technique for Administering Intravenous Solutions and for Blood Transfusion", *The Lancet*, December 28, 1935, page 1476.

(3) H. L. Marriott and A. Kekwick: "Method of Bleeding Transfusion Donors", *The Lancet*, July 13, 1935, page 78.

(4) H. L. Marriott and A. Kekwick: "Continuous Drip Blood Transfusion, with Case Records of Very Large Transfusions", *The Lancet*, April 27, 1935, page 977.

(5) I. J. Wood: "The Technique of Continuous Intravenous Administration of Glucose-Saline Solutions and Blood", The Medical Journal of Australia, December 19, 1936, page 845.

Reviews.

ASTHMA.

A. G. Auld is well known for his writings on asthma. In 1936 he published in one volume many of his papers on asthma, its causation and treatment.[1] The most important aspect is that concerning treatment. First he praises various drugs, potassium iodide, with arsenic sometimes, or with Peruvian balsam, and cod liver oil with the last-mentioned preparation. He insists on the dangers of morphine, cocaine and similar habit-forming drugs. Diet he also understands, and indicates the necessity for small meals, with little carbohydrate or flatulence-producing vegetable, and simple watery drinks. His main theme, however, is treatment by peptone.

In 1917 he found that subcutaneous injections of Witte's or Armour's peptone relieved asthma in several patients. It has been suggested that peptone is closely allied to, or is the actual anaphylactic poison which causes the asthma paroxysm. Next, he employed intravenous injections of peptone, and lately has used only intramuscular injection of Witte's 30 peptone.

Auld has little faith in treatment concerned mainly with pollens and other substances to which the patient may be sensitive. He regards the excitants as mainly autogenous, some metabolic product, either faulty in itself or inadequately reduced. As a rule, he writes, nasal treatment does not benefit either asthma or hay fever; but he qualifies this statement later to some extent.

Human serum and peptone have also been used together in a dose of 0·5 to 4·0 cubic centimetres intragluteally; and in his last paper Auld describes his use of bismuth, based on the theory that bismuth is good for yaws, relapsing fever and syphilis, which tend to relapse; hence it might be good for asthma, by raising the minimizing power of the reticulo-endothelial system. "Bismoxyl" or precipitated bismuth (B.P.) was injected intramuscularly twice a week for two or three weeks.

At the end of the book Auld inserts a number of lectures given by himself, as far back as 1895, on chronic bronchitis and other subjects. On the subject of asthma it is a valuable contribution to the literature.

[1] "The Nature and Treatment of Asthma, Hay Fever and Migraine", by A. G. Auld, M.D.; 1936. London: H. K. Lewis and Company Limited. Demy 8vo, pp. 267. Price: 12s. 6d. net.

The Medical Journal of Australia

SATURDAY, MARCH 6, 1937.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL.

THOUGH very many who could see the significance of what was taking place expressed the greatest satisfaction at the announcement last year that a National Health and Medical Research Council would be established, there were others who for various reasons predicted for the venture nothing but ineffectiveness and failure. When the items on the agenda paper for the first meeting of the council became known last January, heads were shaken and shoulders were shrugged by those who had their doubts. At the dinner given by the Council of the Victorian Branch of the British Medical Association to the Federal Council and others, Professor F. Wood Jones, in replying to the toast of his health, gave these people a gentle, but just, rebuke. He said that in his youth he had been taught not to judge a cigar by the picture of the lady on the box. He recommended everyone to wait and see and not to rush to the conclusion that the National Health and Medical Research Council would be useless from the research point of view.

The first meeting of the council has been held and certain steps have been taken of which medical practitioners should be made aware. In another place in this issue we publish a *résumé* of the chief addresses delivered at the meeting, together with the resolutions that were finally adopted. In our account we have paid attention chiefly to what the several speakers had to say about research. Unfortunately no information about the general discussion on research is available; doubtless it will be included in the official report. Several features of the council's recommendations regarding research call for emphasis. Most important is the decision that the council shall deal with research through the agency of a special subcommittee comprising Professor F. Wood Jones, Professor H. R. Dew, Dr. Harold Ritchie, Dr. J. Newman Morris and the Chairman (Dr. J. H. L. Cumpston). It will be remembered that when the Federal Council of the British Medical Association in Australia discussed the proposed formation of the new council, the view was expressed that such a body could deal with research only through the agency of a subcommittee composed of those who had special knowledge. The subcommittee, moreover, is empowered to consult any person whose advice is desired. The creation of research fellowships will be a satisfactory method of assisting research workers. A great deal might be written about fellowships in research and the futility of expecting results to be forthcoming at once. Those who have been appointed to the council and to its subcommittee know all these things; and we feel that the immediate future may be left in their hands. To anticipate failure is to encourage it; to expect success (and we do expect it) is to be on the road to meet it.

Special stress has been laid on this new council and the part that it is to play in medical research. It must be remembered that public health problems, in their preventive, curative and research aspects, are also part of its concern. For the carrying out of its programme the council is asking the Commonwealth Government for the sum of £30,000. This is not a large amount in view of the ground that has to be covered. The work of the council will be carried on satisfactorily only if there is con-

tinuity in its undertakings. The grant must be secured to the council by legislation that will make it unnecessary for a sum to be voted to it annually. If the Council is to be at the mercy of a treasurer who may be looking for something on which he can effect a saving, it will soon be hamstrung.

Current Comment.

FOODS AND THEIR VALUE.

From time to time during recent years analyses of various foodstuffs have been made, and it is usually found that alterations have to be made in figures previously accepted. The Medical Research Council has recently issued a report on the nutritive value of fruits, vegetables and nuts, for which R. A. McCance, E. M. Widdowson and L. R. B. Shackleton are responsible.[1] This report indicates several corrections which have to be made in previously published tables; for instance, the authors point out that in books published as late as 1932 the figures quoted are in many cases those of Attwater and Bryant's analyses made in 1906. Modern methods have shown that there are many errors in the work done at this time; for example, in the carbohydrate values, which were calculated "by difference", a method which allowed definite and sometimes considerable error to creep in. The clinicians, utilizing analytical tables of foodstuffs, have no doubt observed from time to time that the carbohydrate values previously given for some foods have been reduced in more recently issued tables; but there are many other points of variation to be taken into consideration. For example, it is not correct to speak merely of the protein content of foods such as fruit and vegetables when the nitrogenous element is intended, for it is found that in some cases there is quite a definite proportion of nitrogen present which is not protein. Another error is due to the presence of inulin, one of the fructose condensation products which in some vegetables plays the part of a reserve store of carbohydrate. This substance is not hydrolysed by any enzyme present in the alimentary tract of mammals, and therefore its food value is probably inferior to that of starch. Artichokes, for example, contain inulin, and it is open to question whether this substance is readily absorbed or not, though, if the vegetable is stored for any length of time the inulin tends to break down and thus becomes more readily available. The authors of this report consider that only about 50% of the carbohydrate in vegetables of this class can really be utilized; these considerations are not merely academic, for what matters from the point of view of nutrition, particularly in the dietetic treatment of disease, is not so much the actual composition of the food, but the composition of that portion of it which is readily absorbed by the body. It seems likely, therefore, that just as we have had to revise our views about those vegetables which we once regarded as containing 5% carbohydrate, so we shall have to approach other aspects of this question of food analysis at different angles. The inorganic constituents of plant foods are of particular importance. McCance and his co-workers draw attention to the extraordinary variation in the results of different workers. In these analyses, for example, they state that one author puts the iron value of carrots at 9·0 milligrammes per 100 grammes, and yet another places it at only 0·2 milligramme. Even allowing for natural variations, it would appear that further work is necessary before normal standards can be expected. Another interesting matter dealt with in the report is that of the so-called roughage, which is the unavailable carbohydrate. This consists chiefly of cellulose, pectin *et cetera*, and, although only about half the amount of cellulose eaten is recoverable in the food residues from the body, the disappearance of the other moiety is due to bacterial action and not to digestion. The roughage content of food is surprisingly variable. Some of the figures are interesting; for example, dried apricots 24%, dried figs 18·5%, and dried prunes 16·1%. Many vegetables, however, contain very small quantities, the green leaf vegetables ranging only from 1·6% to 4·5%. Indeed the total amount of roughage in most vegetables is relatively small, a fact which, as the authors point out, seems to have been overlooked by medical writers in the popular Press, who speak confidently of the value of green vegetables in the treatment of constipation. Some of the facts gleaned from this report are interesting, but hard to understand; for example, the variable amount of fat in nuts, for, although it was nearly always more than 35%, in chestnuts it is only 5%. In fruits, fat is negligible, except in the olive and the avocado pear, which contain 11% and 8% respectively. It is curious that most nuts contain large quantities of potassium, although very little sodium. Phosphorus, though present in large amounts in some foods like nuts, is not always available for nutrition, as some of it is present in the form of phytin phosphorus.

As regards the carbohydrate in fruits, it is known that it is chiefly represented by sugar, which may be glucose, fructose or sucrose, and the proportions of each of these vary very considerably. Thus sucrose constitutes the major part of the sugar represented in apricots and peaches, a fact which must be borne in mind if it is desired to limit this particular kind to sugar in a patient's diet. The unripe banana contains starch, but this is exceptional. Most of these disconnected facts are not really novel, but, being emphasized in a recent and probably authoritative report, they are of value and interest to the medical profession.

The report also contains further studies of the changes occurring in foods through cooking. Similar

[1] "The Nutritive Value of Fruits, Vegetables and Nuts", by R. A. McCance, E. M. Widdowson and L. R. B. Shackleton, Medical Research Council of the Privy Council, Special Report Series, Number 213; 1936. London: His Majesty's Stationery Office. Pp. 107. Price: 2s. net.

studies were made some time ago on meat, and the present observations follow up this work. One interesting fact is that any waste incurred in throwing away the water in which vegetables have been boiled is very small; furthermore, fresh vegetables lose hardly any of their salts when soaked in cold water. This report contains detailed tables conveying results of the various analyses, and also an account of the chemical methods employed. It is a valuable contribution to the subject, not only to the analytical chemist, but to the clinical worker who wishes to assemble the useful and relevant facts concerning common foodstuffs. The present position as regards the problems of food and nutrition is still confused: old and often false doctrines, preconceived fads and fancies still sway both the medical and lay public to some extent, possibly sometimes to a great extent. The only corrective to this is the slow building up of accurate knowledge by this type of research, which surely must demand great patience and attention to detail, but which undoubtedly adds to the growing edifice.

THE DANGERS OF CARBON TETRACHLORIDE IN INDUSTRY.

THE casual reader might imagine that poisoning with carbon tetrachloride is a subject so remote from ordinary practice that it is not of much interest. It must be remembered, however, that carbon tetrachloride is the cheapest fat solvent available in industry; it is non-inflammable in addition, and is widely used for the so-called "dry-cleaning" processes. Though its vapour is very toxic when concentrated, there is little danger when it is used with adequate precautions; but it is probably well known that this substance can cause spoiling of the liver cells, leading to cirrhosis after prolonged exposure. Such exposure could, of course, not occur by casual use, but only in those industries in which the workmen are constantly engaged in some process in which the substance is used in bulk. Animals that have been the subject of experiment with this substance show damage in both kidneys and liver, and even pneumonia of a toxic type.

H. F. Smyth and H. F. Smyth junior have investigated the limits of safety in exposure to carbon tetrachloride vapour, using animals of various kinds, and also making observations on workmen who have shown certain toxic signs or symptoms.[1] The chief signs of toxicity are lowering of the blood calcium content, increase in the icteric index of the serum, restriction of the visual fields, and changes in blood cytology. They found that men who have worked for long periods in exposure to this vapour have developed a definite degree of resistance, as do laboratory animals, and, being salted as it were, are actually less liable to develop trouble than newer hands. Where brief exposures occur, symptoms arise such as headache, dizziness, nausea and undue fatigue; but these are evanescent. On the whole, however, out of a carefully investigated series of 96 men exposed to carbon tetrachloride in the course of their daily work, none was found to be injured by the vapour. Nineteen men had actually worked for ten years with this solvent. The authors suggest that men doing this work should be examined at intervals, so that, should suspicious symptoms arise, they may be rested and in this way aid the regeneration of any damaged cells and help to gain tolerance to further exposure. The addition of calcium to the diet of animals appears to increase the degree of their resistance to carbon tetrachloride vapour, and there seems to be some evidence that this is helpful in the human subject also. The exact concentration of vapour recognized as safe (not more than one hundred parts per million) is of interest only to the expert in industrial medicine; modern cleaning plants, which use either closed systems or those with adequate ventilation, are not likely to cause danger. But it is important to realize that this solvent is not safe for indiscriminate use. Medical practitioners, even those not specially interested in factory hygiene, are sometimes asked to render professional services to commercial concerns, and it may fall to their lot to deal with emergencies. For example, since accidents may occur, it is possible for men to be acutely overcome by carbon tetrachloride fumes. One of the contributors to the discussion on this paper stated that he had known three instances in which adrenaline had been administered to men unconscious and acutely poisoned by these fumes, and in each case death had occurred immediately, presumably from ventricular fibrillation. Oxygen and the intravenous administration of a suitable calcium salt are recommended as being effective and unattended by risk.

[1] *The Journal of the American Medical Association*, November 21, 1936.

IMMUNITY IN MALARIA.

MANY authorities believe that there is no actual immunity in protozoal diseases; that freedom from symptoms is due merely to tolerance of the parasites. But D. Sotiriadès claims to be able to induce a passive immunity to malaria.[1] He obtained blood from patients who had recovered from malaria, or who were suffering from chronic natural malaria, with enlargement of liver and spleen, but without fever, and he injected the blood or serum into persons suffering from tertian malaria fever. His most interesting results were obtained from the intravenous injection of blood obtained from patients who had recovered from malaria. These results were sufficiently striking to warrant the conclusions that immunity is developed in this disease and that such immunity is transferable. Further experiments along these lines might lead to a valuable increase in knowledge of malaria and its treatment. It cannot be said that knowledge thus gained would be of academic interest only.

[1] *The Journal of Tropical Medicine and Hygiene*, November 16, 1936.

Abstracts from Current Medical Literature.

SURGERY.

Treatment of Acute Empyema.

M. P. Travers (*The American Journal of Surgery*, October, 1936) outlines the clinical course following satisfactory treatment of acute non-tuberculous empyema by operation. In organism cases suppurations may be responsible for an empyema, but the majority are due to the pneumococci or streptococci. The organisms found in empyema are the same as those which cause suppurations elsewhere; but in most cases pneumococci or streptococci are responsible for the condition. The most severe types are due to the *Streptococcus hæmolyticus*. The pneumococcal type usually comes late in pneumonia, and is associated with a highly fibrinous pus. The streptococcus may cause a marked exudate, possibly obscuring the underlying pneumonia. The pus in the pneumococcal type will become fibrinous only at the end of some days or weeks. Clinical signs and symptoms may often be misleading, consolidation of a lung and pleural effusion being frequently mistaken. X ray examination and puncture needle are reliable guides. If possible, it is often advisable to await fixation of the mediastinum before performing any open operation, in order that the vital capacity may not be further diminished. Opinions have differed as to when sufficient fixation may occur. It is surmised that in pneumococcal infections about ten days are required, whilst with the streptococcus about twice that time is necessary. It is noteworthy that mortality has varied greatly in different years and in different epidemics. The nature of the infecting organism is only one of the variable factors in assessing mortality. In very toxic cases conservative treatment may be adopted, aspirations being carried out until the condition becomes operable. A clamped-off catheter may be inserted in the pleural space of children, suction being applied every few hours. Many surgeons think that rib resection is seldom necessary. Koster has recently advocated pneumothorax on the sound lung to aid, by pressure, the drainage of the opposite pleural space. A great decrease of vital capacity must follow this procedure. Conners advocates the resection of two ribs, with extensive packing of the pleura, exactly as abscesses elsewhere are treated. Much discussion has centred around the advisability of irrigating the cavity. Blow bottles are of doubtful value in causing reexpansion of the lung. No form of exercise or treatment can replace adequate drainage. Poor drainage is followed by adhesions, favouring a chronicity and the formation of a permanent cavity. Chronic empyema not due to tuberculosis may be caused by insufficient surgical treatment. Some form of closed drainage would seem to be essential to avoid immediate catastrophe. Unless adequate continuous drainage is provided, chronicity is sure to supervene. Nicoll has advocated incising the pleura at a higher level than the skin, so that the incision itself would act as a valve. The author comments on the mortality. He notes the futility of operation in certain overwhelming infections. He advocates the use of a Wilson button to prevent pneumothorax.

Duodenal Ulcer and Complications.

Presumably due to the poor diet and vitamin *A* deficiency, the incidence of duodenal ulceration is high in Travancore, India; T. H. Somervell and I. M. Orr (*The British Journal of Surgery*, October, 1936) record their impressions of the ætiology, pathology and treatment of this condition after a study of 2,500 cases in that State. In Travancore probably five in every thousand adults suffer from duodenal ulcer; in view of this it is interesting that in the series of 2,500 cases in ten years, only four cases of perforation were encountered, and hæmorrhage was rare. In about 40% of cases there was cicatrization of the duodenum, with stenosis, accompanied by dilatation of the stomach—ideal cases for gastro-enterostomy. The condition is found to be much more common where the population is sparse and where tapioca is eaten as the main item of diet. It is recorded that in one district, which was almost free from duodenal ulcer, the people have recently adopted the habit of eating tapioca root and are now producing a continually increasing number of cases of ulcer. In vitamin *A* deficiency the defences of the gastric mucosa are lowered. This allows invasion by bacteria, which set up chronic gastritis and duodenitis. Following this the rupture of small abscesses in the lymph follicles leads to ulcer formation, and the ulcers thus formed, if continually irritated with a highly spiced diet, become chronic. Such a process is suggested by the experiments of Sir Robert McCarrison, who fed rats on diets obtained from Madras and Travancore respectively. He found: (i) that 11·1% of rats fed for 675 days on the Madras diet developed gastric ulcer; (ii) that 27·7% of rats fed for 675 days on the Travancore diet developed gastric ulcer and 11·1% developed a severe duodenitis. McCarrison found also that the rats fed on the Madras diet developed ulcers in the proximal portion of the stomach, while in rats fed on the Travancore diet the ulcers developed in the distal portion. In the rats fed with the Travancore diet (tapioca, chillies, pepper, rice and a little fish) the stomach was dilated; the mucous membrane was frequently congested, especially in the region of the pylorus; in some cases there were shallow ulcers in the pyloric region; the duodenum was often markedly congested, and there was round-celled infiltration of many of the glandular organs, with occasional small hæmorrhages. These pathological changes correspond closely with the microscopic appearances noted in human patients in Travancore. The authors discuss the treatment of duodenal ulcers and their complications. They express their preference for gastro-enterostomy when there is stenosis, and high gastrectomy, without excision of the pyloric antrum, for gastric or gastro-jejunal ulcer and for duodenal ulcer associated with a high degree of acidity and rapid emptying of the stomach. Reference is made to vomiting as a post-operative complication of gastro-enterostomy. The authors point out that this is sometimes due to bile in the stomach, when this organ has been for a long time unused to its presence because of pyloric obstruction. In many of these cases relief is obtained from stomach lavage, followed by the administration of a little acid. Sodium bicarbonate makes the patients worse, as it is the alkaline bile to which the stomach objects.

The Effect of Some Drugs on the Intestines.

J. S. Guthrie and J. A. Bargen (*Surgery, Gynecology and Obstetrics*, December, 1936) record the results of experiments to evaluate the action of surgical pituitrin, physostigmine, peristaltin and acetylcholine on the intestine of man. Experiments were made on patients who had been subjected to ileostomy or colostomy. Rubber balloons were introduced into various parts of the bowel so that the effects on the different segments could be observed. Of the four drugs used, pituitrin alone was found to be a marked stimulant of the human intestine, and in the light of the results of these observations it is the only drug of this group that is likely to be effective regularly as a therapeutic agent in augmenting the peristalsis of an atonic or paralysed bowel. The effect on the intestine that was observed to follow every administration of pituitrin was so constant that the authors feel justified in concluding that this drug is a powerful stimulant of intestinal peristalsis, that it is consistent and regular in its action, that it acts with apparently equal strength on the colon and the ileum, that it increases the motility of the intestine without apparently exerting any effect on the tonus, and that it is rapid in its action. It was found to act within three to five minutes and to continue to act, with gradually decreasing effect, for from three-quarters of an hour to an hour and a half. Physostigmine and peristaltin, although they were observed at times to increase the tonus as well as the motility of the colon and the ileum, were found to be inconstant and uncertain in their action. Moreover, the peristaltic contractions that each of these drugs produced were relatively mild, less regular in their occurrence, and totally lacking in propulsive

force, as compared with the contractions following each injection of pituitrin. Owing to systemic reactions, the authors did not use the very large doses of physostigmine advocated by some workers. The results of the administration of acetylcholine appeared to indicate that this drug possessed little worth as a stimulant of the human intestine. On seven of the nine occasions on which the drug was employed in doses ranging from 100 to 400 milligrammes, no evidence of any effect on the intestine was in any way apparent; while on the two occasions on which some increase in either the tone or the peristaltic activity of the colon or ileum was observed, the stimulative effect of the drug was relatively slight as well as transient in character.

Gravity Drainage of Pelvic Abscess.

A. LEE MCGREGOR (*The British Journal of Surgery*, October, 1936) summarizes several of the previously expressed views on gravity drainage of pelvic abscess, and gives the details of three cases. He considers that rectal or vaginal drainage of a pelvic abscess is a valuable therapeutic measure. In the majority of cases recovery is prompt; but if the patient is gravely ill, it may be followed by cystitis, extraperitoneal cellulitis *et cetera*. But this is the type of case in which the indications for gravity drainage are least contentious. The two main risks are mistakes due to faulty diagnosis and injury to the small bowel. If the diagnosis is in any doubt, abdominal section is necessary, followed, if indicated, by gravity drainage. In a few cases the small bowel may herniate through the drainage opening. Should it prolapse into the vagina there is not much harm done, provided the emergency is promptly and suitably dealt with; but if prolapse into the rectum should occur, the issue is likely to be fatal. To strengthen these points the author concludes with some negative rules: never drain *per rectum* or *per vaginam*, when the diagnosis is in doubt, without preliminary abdominal section; never drain through any but an opening exactly in the median plane; never perform the operation unless a catheter has been passed while the patient is on the operating table; never stitch the drainage material to the anus; and never drain below if the abscess in the pelvic *cul-de-sac* bulges into the rectum or vagina on one side only.

Surgery in Hypertension.

A. W. ADSON (*Western Journal of Surgery, Obstetrics and Gynecology*, November, 1936) describes the surgical treatment of essential hypertension, a condition characterized by an abnormally high blood pressure that under excitement and physical strain frequently rises suddenly to high peaks. It develops most frequently in young people in the third and fourth decades of life, and its progress may be slow, moderate or rapid. The condition is probably due to a fault in the neurogenic-endocrine vascular mechanism, which, in these patients, appears to respond excessively to normal stimuli. One of the most important tests applied is the cold pressor test, which consists in placing the patient's hand in water at 4° C. and taking the blood pressure. The basal blood pressure is taken during rest; the hand is then placed in the cold water, and in thirty seconds the blood pressure rises to what is known as the ceiling or highest response. The blood pressure returns to normal in from two to eight minutes. This pressor test is a measure of the individual's response to a given stimulus; it is constant for the hypertensive or prehypertensive individual, and is two to five times greater than that found in the normal or non-hypertensive subject. The test is also used to evaluate the effects of treatment. The author then details the operative procedure employed in suitable cases, and discusses the results. The operation, which is done in two stages, consists of bilateral partial resection of the suprarenal gland, with resection of the splanchnic nerves and the first and second lumbar ganglia.

Allantoin.

F. R. GREENBAUM (*American Journal of Surgery*, November, 1936) gives a brief historical review of maggot therapy in osteomyelitis, chronic or varicose ulcer, *pruritus ani* or *vulvæ*, burns, and wounds that refuse to heal. Its use has increased following the discovery that allantoin is the active principle of the excretion of the maggots. The author describes a solution and an ointment containing 0·4% and 2·0% of allantoin respectively, and makes a clinical evaluation of their use.

Hallux Valgus.

ERIC I. LLOYD (*The British Journal of Surgery*, October, 1936) has made a comparison of the results of two different operations for *hallux valgus*. He selected twenty patients suffering from bilateral *hallux valgus*, and, in each case, excised the head of the first metatarsal bone on one foot and the base of the first phalanx together with the metatarsal exostosis on the other. The after-treatment was the same, whatever operation was performed. The toe was held in position for seventeen to twenty days with a zinc-gelatine bandage. The patients were encouraged to walk early, and in most cases the soles of the shoes were thickened by 0·6 centimetre (a quarter of an inch) on the outer side, to enforce weight-bearing on the first metatarsal and to prevent metatarsalgia. At the end of a period varying from one to three years each patient was asked which foot was the more comfortable. Four patients said that the side on which the metatarsal head had been excised was the more comfortable; five had the greater comfort in the other foot; the remainder (eleven) could observe no difference between the two sides. The author stresses that the verdict in each case is the patient's, "and refers solely to the relief of pain one to three years after the operations". He points out that metatarsalgia sometimes exists before operation and, as Perkins has shown, it is not relieved by operation on *hallux valgus*. In addition, some people induce metatarsalgia by refusal to bear weight on the inner border of the foot. "They may thus spoil the functional result of a successful operation and even select the wrong toe as being the more comfortable by erroneously attributing the metatarsalgia to the operation." The author believes this may have occurred in his series; but remarks that it is impossible to make allowance for it. He suggests in conclusion that the results "indicate that there is nothing to choose between the two operations as a means of relieving the pain of *hallux valgus*".

Appendiceal Abscess Complicated by Gas Gangrene.

STUART GORDON (*The British Journal of Surgery*, October, 1936) reports a case in which appendiceal abscess (treated without operation) was complicated by gas gangrene. Four days after his admission to hospital, and seven days after the commencement of his illness, the patient suddenly felt much worse. It was thought that the abscess had ruptured. The following day false emphysema appeared in Scarpa's triangle on the right side. Gas gangrene antiserum was given. The thigh swelled rapidly, until it was twice its normal size. More gas gangrene antiserum was given, and the thigh was incised; foul-smelling gas "hissed and bubbled out behind the scalpel". The patient died the same day. At *post mortem* examination a large appendiceal abscess was found; the appendix had ruptured at its base; there were bubbles of gas in the iliacus muscle; and there was a mild general peritonitis. The author suggests that the organisms responsible for the gas gangrene spread from caecum to abscess, to iliacus muscle, and to thigh. Reproductions of skiagrams of the thigh, showing bubbles of gas, appear as illustrations to the report.

Pseudotuberculoma Silicoticum.

K. C. EDEN AND J. HERBERT-BURNS (*The British Journal of Surgery*, October, 1936) report a case of what S. G. Shattock, in 1916, described as *pseudotuberculoma silicoticum*. This condition results from the implantation of particles of silica in the skin. The subsequent local reaction consists in the formation of giant-cell systems, and fibrous trabeculæ, and invasion by epithelioid cells and lymphocytes. The appearances closely resemble those of a tuberculoma; but tubercle bacilli cannot be found, and there is no caseation. In the authors' case the patient had fallen on a hard road sixteen years previously, injuring the forearm. A diagnosis of implantation dermoid was made. The true nature of the tumour was ascertained after excision and histological examination. Particles of silica were observed by polarized light.

Research.

THE NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL.

THE first meeting of the National Health and Medical Research Council took place at Hobart, Tasmania, on February 1, 1937, Dr. J. H. L. Cumpston, Director-General of Health, Commonwealth Department of Health, the Chairman, in the chair.

The Chairman welcomed the Right Honourable W. M. Hughes, P.C., Commonwealth Minister of Health, who addressed the gathering.

Mr. Hughes said that the functions of this council were clearly expressed in its name. It had been established to promote the health of the people of Australia, to protect them from disease, and to advise, coordinate and direct research into the cause of and cure for those diseases which levied so heavy a toll upon the community and which had hitherto baffled medical science.

The importance of these functions, national in the broadest sense of the term, could hardly be exaggerated, and the council was clothed by the Commonwealth and States with all the authority necessary for their exercise. The council was charged with heavy responsibilities and was given great opportunities for national service. The extent to which the health of the community was raised, disease conquered and mortality reduced, would be the standard by which the people of Australia would measure the value of its labours.

The council was well equipped for its great work. It was indeed a happy augury for its success that its personnel was representative of all branches of medical science. There were balance and harmony in the council, which would, he felt sure, make strong appeal to the public.

Discussing the task that lay ahead of the council, Mr. Hughes said that its first objective was to raise the standard of health of the community. By health he did not mean a negative condition, mere freedom from active disease, but that state of abounding energy and vitality that made one rejoice and be glad to be alive. Unhappily, health, which ought to be the heritage of all, was not enjoyed by a disconcertingly large number of citizens. Many seemed condemned to go through life "missing in one or more cylinders"—they had no energy, their day's work was a trouble, they were easily fatigued, their powers of resistance to disease were at a low ebb. Last year in New South Wales, with a population of some two and a half millions, no less than 684,000 persons received treatment at public hospitals. How many were treated in private institutions and in their own homes was not known, but, on a most conservative estimate, it must have been a formidable number. This sickness, this ill-health, must have a far-reaching consequence; its effects upon the economic output and the social and political life of the community could hardly be exaggerated. Why were so many people sick or below par? Certainly the climatic conditions of this country were not responsible. What was the cause? The council would not, he was sure, tell the people that nothing could be done to raise the standard of health. The people of Australia were bred from good stock; they lived in a good climate. Why, then, so much sickness, malnutrition, under-nourishment? The Commonwealth Government had appointed a committee of inquiry into nutrition and now awaited its final report. Speaking as a layman, Mr. Hughes believed that in an ill-balanced dietary, from which vitamins, essential chemical elements and roughage had been eliminated, they had the cause of very much of the ill-health and many of the diseases from which people of this and most civilized countries suffered. One thing was certain: Australia could not afford to have so many sick people. Whatever needed to be done to raise the tone of public health had to be done. He most earnestly asked the council to speak very plainly on this vitally important matter.

The birth rate had fallen in a very disturbing fashion for some years, and the latest statistical returns revealed a further decline. While it was true that a reduced birth rate was common throughout most of the civilized world, it had special and alarming implications for Australia. The problem of migration was outside the scope of the council, but the declining birth rate, maternal mortality and morbidity, deaths of infants under one week, still-births and abortions must engage its early attention.

Many great problems confronted the Commonwealth, but the declining birth rate overshadowed them all. It was impossible to exaggerate its gravity. Australia was bleeding to death. The indifference of the general public to all that the decline in the birth rate involved filled him with dismay. Taking the average birth rate during the years 1901-1921 as a base, the loss to the community owing to the decline in the birth rate up to 1936 amounted to the staggering total of 500,000. They were losing no less than 65,000 a year. The loss of population through the fall in the birth rate since 1921 was nearly ten times as great as that caused by four years of war, and the loss each year was greater than the aggregate loss in four years of war. The war came to an end, but the loss through the falling birth rate went on and increased from year to year. They were sliding down with ever-increasing rapidity towards the abyss.

Mr. Hughes then referred to maternal mortality and infant mortality, and discussed shortly the problems of tuberculosis and cancer.

Turning to the question of research, Mr. Hughes said that by coordinating and guiding research the council could do great work. It was not for a mere layman to pose as a critic, yet he could not help thinking that research, as carried on today in Australia, left something to be desired. As he saw it, there was much overlapping; research workers in one State knew little or nothing of what men engaged in the same field in other States were doing. In this way much effort and money were wasted. Again, there was no central authority to whom research workers in various fields could report the results of their investigations, yet this would appear to be most desirable; for it could not be too strongly emphasized that the end of all research work into the causation and cure of disease primarily concerned the public. Research was not carried on for the honour of the research worker, but to cure disease and to alleviate suffering. And, approaching this question from another angle, the need for coordination and direction of research by the council appeared to be most desirable, because it might easily happen that a research worker specializing in one branch of science might not appreciate the value of the results of his work to specialists in another and quite different field. Mr. Hughes did not wish to have it supposed for a moment that he thought too many were engaged in research work; on the contrary, he was inclined to believe that they would with advantage make use of many trained young men who had yet to establish themselves in private practice. But they ought to be content with nothing less than original research. Australia, priding itself on being a nation, ought not to be satisfied to follow, to imitate, to duplicate. She must blaze a track for herself, seek to lead rather than to follow; and this called for the services of specialists of high repute to train, inspire and direct budding research men and to guide research along right lines.

The truth was that research work wanted organizing, and this council, by virtue of its status and the high reputation of the distinguished men who composed it, was clearly indicated as the body to organize it.

Chairman's Address.

Dr. Cumpston, in his inaugural address, said that the first meeting of the newly constituted National Health and Medical Research Council marked an epoch. This was the beginning of a new combined and concerted attack by all the mobilized resources of this Commonwealth on problems of health and disease. Never before in this country had such a programme as was now possible for this council been contemplated. In no other country had an attempt been made to combine the preventive and curative aspects of medicine and the search for new knowledge in the science of medicine in one comprehensive scheme, and in no other country was there this happy

combination of the official administrative agencies representing the social aspects of medicine and scientific and clinical workers.

It would be their duty as individuals and as members of the council to formulate a programme with whatever wisdom had been given to them and to supervise the administration of that programme throughout a long series of years. It was of primary importance that they should visualize clearly the scope of their work, the ideals which they set for themselves, the principles on which the practical expression of those ideals rested, and the executive details by which all these were translated into effective action.

Dr. Cumpston then dealt with the historical background of the council over the past fifty years, and acknowledged the definite contribution to the world's sum total of medical wisdom made by individual research workers in Australia. The development of public health agencies and the record of clinical medicine were referred to. The union of these three aspects of medical work had begun nearly thirty years previously with the passage of the *Invalid Pensions Act* in 1909. This for the first time brought into being a practical knowledge of the community's responsibility on a national scale for conditions of individual health.

War brought about a threatened shortage of biological therapeutic remedies, revelation of the physical standard of the population, unprecedented incidence of venereal disease and cerebro-spinal meningitis. Repatriation questions of great magnitude had to be met and outbreaks of plague occurred. All these had called for the united resources of the whole community and ceased to be matters of merely State administration. The 1918-1919 influenza epidemic marked the first occasion in Australia in which a large scale epidemic, theoretically and administratively a public health matter, became the concern of every medical practitioner.

The Royal Commission on Health followed in 1925; it took a national view of all the major aspects of medical policy. It recommended the formation of two bodies—a Federal Health Council and a Medical Research Council. The first was immediately formed and had met regularly since 1926, dealing with a considerable range of matters within the recognized range of the functions of a public health department. Some of these matters were uniformity in classification of vital health statistics, health of aborigines, school medical services, metropolitan milk supplies, Commonwealth registration of medical practitioners, maternal mortality, and control of various infectious diseases, migration, poisons and biological preparations.

Dr. Cumpston then referred to other matters which had come up for consideration, such as newly recognized virus diseases widely distributed, cancer, nutrition, the treatment of cripples, the care of women in child-birth, and tropical medicine. The new aspects of medical publicity and broadcasting demanded attention. The veterinary and dental professions had become highly organized. He pointed out that on the other hand the medical profession had become even more highly organized than before—perhaps a little over-organized. The physicians, the surgeons, the radiologists and students of other branches of medicine were forming their own organizations, threatening a possible disunity or discontinuity of effort which should be considered.

It was clear that the procedure of public health had now become universal. All public health problems had application to the individual, but also all problems of individual health had a social significance; this was evidenced in the *Invalid Pensions Act*.

They could not say today that the governmental machine must stop on the individual barrier at any point, for the public had been educated to a stage at which it would not recognize close preserves for the government and the private doctor respectively.

Public health was merely the application of the facts or principles of medical science to the social organism; medicine and surgery were the application of exactly the same facts and principles to the individual organism; and research was the search for new facts and principles. The purpose of the National Health and Medical Research Council was to combine all these aspects of medicine so that their relation to the social body might be expressed in practical terms. All agencies engaged in this common campaign were represented.

Dr. Cumpston then referred to the establishment of the Medical Research Committee (afterwards the Medical Research Council) in Great Britain and to its relationship with official agencies. The scheme of work submitted to the Minister of Health was laid down in the following terms:

> The object of the research is the extension of medical knowledge with the view of increasing our powers of preserving health and preventing or combating disease. But otherwise than that this is to be the guiding aim, the actual field of research is not limited and is to be wide enough to include, so far as may from time to time be found desirable, all researches bearing on health and disease, whether or not such researches have any direct or immediate bearing on any particular disease or class of diseases, provided that they are judged to be useful in promoting the attainment of the above object.

After the intervention of the Great War the following reference was made in a Research Council report to the relationship with official agencies:

> Chief among the immediate problems of the future will be the relationship to be worked out between this renewed organization of the Medical Research services of the Kingdom in general with the research and intelligence services forming an integral part of the Ministry and Boards of Health as such. The Committee may perhaps be permitted to refer very briefly here to the bearing upon this which they can find in their past experience. The problem of the exact demarcation of the two spheres of research work, that of the general Medical Research service of the United Kingdom on the one hand, and that of the Ministry of Health for England and Wales and of the equivalent bodies in Scotland and Ireland on the other, is a problem made difficult only by the high importance of not maintaining in practical effect any line of demarcation at all. Delimitation of the boundary line would be theoretically easy if it were not so dangerous in practice to attempt any separation of the two fields. It appears to the Committee wisest indeed not to direct attention to the boundary line, but to allow this to find its natural adjustment in daily practice as the central labours in the two fields of work are actively forwarded. It would be a vital mistake in their view if either on the one hand the centralized research organization were restricted to primary or "academic" research work divorced from the practical needs of Government Departments, or if, on the other hand, the scientific officers of those Departments were restricted narrowly to the study of the immediate administrative problems before them. With friendly cooperation in the great common tasks, it may be taken for granted that all practical difficulties will disappear.

The intention of the Medical Research Council to draw no line of demarcation was carried out.

Dr. Cumpston then quoted from criticisms of the late Lord Moynihan and W. Trotter, taken from *The Lancet* and *The British Medical Journal* respectively. He said that the question raised by these quotations of the relative values of "pure research" and "practical research" was one which had often been discussed in the past. They might rhetorically put the question and then answer it. Was the spontaneous inspiration of the worker in pure science unconcerned with any necessity to produce practical results, the ultimate and only sure hope of science? If so, what, then, of the pressing imperative need for the immediate solution of practical problems? Social problems, almost without number, clamoured for solution; industrial problems in this age of fierce economic stress could not wait upon the scientific worker within whose jealously-guarded, unlimited field of freedom of choice these problems might not have entered. It was in respect of public health, which was, after all, merely the composite

health of individuals, that this dual nature of the problem appeared in an especially urgent form.

In the presence of an epidemic of disease it was impossible to wait upon the individual worker, already absorbed in another important piece of research; an organized inquiry into causes and methods of control must be instituted, must be pushed to produce whatever positive and reliable results were possible as soon as possible.

The successes achieved by the colonial medical services of Britain, America, France, Holland and Germany well justified organized and controlled official research. The brilliant work of the medical services of all nations during the War was evidence that research could be successfully pursued, even under a rigorous system of control.

In this connexion Dr. Cumpston quoted Professor Edward Mellanby, whose life had been hitherto devoted to pure medical research within a university, but who had quite recently become secretary to the Medical Research Council in England:

> Success in medical research depends almost entirely on the type of man attracted to such work. Men of this type are limited in number. They must be clever men, but in addition, men of strong character, capable of hard and often disheartening work and willing to forgo riches.
>
> Is there any royal road likely to lead to important discovery?
>
> Some say that *ad hoc* research is useless, and the only hope is to work on some academic research unrelated to practical utility.
>
> I know no royal road to discovery. Discovery sometimes comes about by pure chance, sometimes by deliberate effort in the direction aimed at. Though important discoveries are rare, and difficult to make in any case, it is no more unlikely that discoveries of first-class scientific interest will result from work directed to practical problems of disease than from work inspired by no utilitarian motive.

Regarding research, Dr. Cumpston said the council had to deal with three phases: laboratory research, clinical research and social or public health research; and he formulated two fundamental cardinal principles: (i) that the unity between the clinical worker and those official agencies responsible for the social aspects of medicine must be preserved; (ii) that the unity between the clinical worker and the laboratory research worker must be preserved.

It had to be admitted that both unities were at present rudimentary, and the improvement and cultivation of these unities must be their first task. The ward worker and the laboratory worker had become increasingly separated, and it was the view of all serious thinkers that they should be brought increasingly close together and that their unity should be made as absolute as possible.

Prevention was the one objective common to all these branches of medicine. Preventive medicine was not in any degree or in any sense the exclusive prerogative of those who followed what was known as public health, and it should be a concept infusing and inspiring all medical work. A great deal of attention should be devoted to the beginnings of disease, and for this purpose clinical research was essential.

In the public health field certain problems might well be given first place. They should be considered under two heads: the general state of public health in the community, and particular aspects—particular diseases which might be approached by one or other of the recognized public health methods. Concerning the latter, Australia had, in common with most countries, such great problems as those of venereal disease, tuberculosis, cancer and leprosy. In all of these the most essential feature was early diagnosis. Puerperal mortality was a field in which little organized effort was recorded, and emphasis was laid on influenza, the common cold, rheumatism and cancer. In all of these diseases, selected because of their outstanding importance, the repeated emphasis upon early knowledge of the case must arrest attention. Probably this pointed as clearly as any other feature to the necessity for closer association between the general practitioner and the ideal of the elimination of these diseases. It also pointed to a feature of medical education which might well displace other portions of the medical curriculum.

Much could be achieved if the beginnings of disease, instead of fully established diseases, could be dealt with. The enormous mass and high percentage of hospitalization must surely be far in excess of the degree of morbidity which a healthy country like Australia should show.

Australians were ignoring the possibilities of prevention of disease at the earliest stage, that of infancy and childhood. While infant welfare clinics were doing good work, they were not approaching possibilities that lay dormant in this form of social endeavour. They were doing nothing for the child between the infant stage and the school stage. School medical inspectors were able to examine only a small percentage of school children. The education of the child in the development of his body was neglected, and while it was known that diet and exercise were important aspects in the retention of health, nothing like adequate pains had been taken to secure proper results. A widespread national campaign was needed to ensure complete and adequate supervision of an intelligent kind over the bodily health of infants, preschool children and school children, over the physical culture of the school child, and over the diet of the community.

The education of the public in matters of health should be organized and continuous. Dr. Cumpston then propounded a general scheme for medical research and pointed out that no expensive administrative machinery would be necessary to give effect to the decisions of the council. Existing departmental machinery with some reinforcement would suffice.

The Problem of Medical Research in Australia.

Professor F. Wood Jones read a paper in which he discussed the problem of medical research in Australia. He first dealt with the medical man as a research worker in Australia. Professor Wood Jones said that in his experience the medically qualified men who approached the heads of departments in Australian medical schools with a view to engaging in research work might be divided into four classes.

(*a*) The first class comprised those who, in order to gain higher degrees, were confronted with the problem of doing some more or less original work as the basis of a thesis upon some professional subject. These men made no pretence at starting out upon a career devoted to research or to any attempt to add to existing knowledge. They were merely undertaking the work as a step to professional advancement. Nevertheless, several quite considerable pieces of work had been done by the better type of man who undertook the writing of a thesis merely to obtain a higher degree. A few of these men would be worth encouraging, by assistance to financial security, to continue their chosen lines of investigation; but, as a class, they were not to be regarded as recruits to the ranks of research workers. Most of them were already committed to the active practice of their profession before they undertook such an investigation; and probably only in very rare cases would it be an economically justified procedure to substitute research funds for the fees derived from practice.

(*b*) The second class was composed of men who had graduated, who had perhaps been overseas, who had taken higher degrees and were professionally at a loose end. They had no practice to step into and perhaps held minor honorary appointments at the leading hospitals. Any fund, grant, scholarship or minor paid teaching post was naturally welcomed by these men as a possible stop-gap during the waiting period until some sort of living might be made from a practice ultimately designed to be that of a consultant. In this class were, naturally, most of the best educated, best qualified and best equipped of the younger medical men. Many of them were men of first class aptitude, with the proper breadth of vision and with critical faculties qualifying them admirably for undertaking research work in medicine or surgery. Despite the undoubtedly high qualifications of these men, their

applications for research grants should always be very carefully scrutinized by those responsible for the allocation of research funds. In the mind of the administrator of grants there should always be the realization that although the few might turn to research for its own sake and might be impelled by the true spirit of the investigator to add to the sum of human knowledge, the many would accept the grant as a welcome assistance in tiding them over a difficult period, and undertake the research as an asset to their other professional distinctions. Research undertaken in the spirit of advancing the research worker's professional reputation and earning capacity and/or as a means of bridging the gap between qualification and professional security should not be encouraged by those responsible for the administration of research funds. It might be said with much justice that a period of conducting systematic and supervised research was an extremely salutary factor in the education of any man who was destined for a high place in the profession. That had to be freely admitted; but the provision for this period devolved rather upon the educational bodies than upon the administrators of funds designed to foster the advance in national knowledge of the causes of disability among the general population. To a certain, though at present inadequate, extent this need was met by the various endowments available in Australian medical schools. If the Australian universities in which medical schools were incorporated, were somewhat more active in securing such endowments of short-time medical research, and especially if they were more punctilious in seeing that such research funds were used purely for the purposes of research, this need would readily be met. But these research funds were generally far more useful in equipping certain individuals to undertake their life's work to better advantage than as the possible source of great increments to the knowledge of disease, and especially of disease as a national problem.

The next two classes comprised the few; but from the point of view of real research, by far the most important section of the medical profession to be considered by those responsible for the allocation of research funds.

(*c*) The members of this class were, in Professor Wood Jones's experience in two medical schools in Australia, very infrequently met with in this country. They were the men who, from student days, were determined to become research workers. To these men the lures of successful practice meant nothing, for they were set upon investigation for its own sake. They were the few and they were the elect. As a teacher in Australia Professor Wood Jones could not ignore the fact that almost all the men of this type that he had had to deal with were now lost to Australia. The academic prospects of these men in Australia were strictly limited. There were few academic posts available here and but little chance of promotion for a young man bent upon an academic career. The young medical man bent upon a life of academic research was, in Australia, much in the same case with the boy who became skilled as a laboratory assistant in some technical branch of scientific work. The young technician, when his apprenticeship was over, joined the ranks of ordinary candidates in the overcrowded labour market; the young medical man intent upon a student's life of research went overseas, and was welcomed in the older universities. Australia was losing men of this type in a small but continuous stream. To such men money was no great lure; but Professor Wood Jones certainly did not think that, because a man was prepared to devote his life to pure research regardless of monetary considerations, he should be requited at a rate that would not satisfy a wharf labourer. If research of national importance was to be carried out in Australia it was of paramount importance that when, rarely, this type of man was available, he should be endowed sufficiently generously to prohibit his seduction to other centres, and to ensure his continuity of work on Australian problems unembarrassed by financial anxieties.

(*d*) The last class was equally rare and equally important to the furtherance of medical knowledge in Australia. Many men, who had all the instincts and the aptitude for research work, were forced into general practice at the conclusion of their academic careers by economic conditions. Many of these men, in consultant or in general practice, retained all their instincts and aptitudes for research work; and many of them had advanced some of the best work done in Australia from the point of view of national health investigation.

No research scheme could possibly afford to overlook the claims of the consultant or of the general practitioner who was at heart a student of medicine and a real research worker. The label "general practitioner" attached promiscuously to those who engaged in general practice was all too often taken to mean that the man so designated was engaged in a hack routine of looking after the sick as a means of livelihood. In some, perhaps rare, cases, this designation should be taken as meaning that a real research worker had gone out among the people in order to gain knowledge of the causes of disability which affected the masses in their everyday life; and this was work of national importance.

From the point of view of the administrator of research funds, this type of medical practitioner was worthy of the most sympathetic consideration. No national research scheme that sought to solve the major problems of the causes and the cure of national disabilities could afford to overlook the claims of the man who, possessing the right attributes for conducting research, was practising his profession, either in the fashionable medical street of a capital city or in some remote outback township.

Professor Wood Jones then discussed the present possible centres of research. He said that there were three types of institution in which the more strictly laboratory aspect of medical research could be carried out. The first of these comprised the buildings and equipment already existing in medical schools. In Australia, although much was said and written as to the duty of the occupants of professorial chairs in our medical schools to add to the sum of human knowledge, and although this duty had actually been fulfilled in some cases, the work had been done despite the conditions under which such posts were held rather than because of them. It was now a generally accepted principle that the members of the staff of any university that pretended to be anything other than a mere institution for cramming students, should be freed from the routine of teaching, examining and administrative duties to such a degree as would enable them to engage in such original investigations as they were capable of carrying out. This ideal also prevailed in Australia, but little had been done to carry the ideal into actual realization. In Australia, the routine teaching and administrative duties that had to be undertaken by the staff of the medical schools were so pressing that, with the best will in the world, it was in many cases quite impossible for research work of any real importance or of any real continuity to be carried out. Such work as had been done by the teaching staffs of Australian medical schools had, of necessity, been done under adverse conditions, and often with much self-sacrifice. It was therefore all the more praiseworthy; but this source could not be regarded as the fountain head of national medical and health research, unless the conditions under which the staffs of the medical schools were employed were radically changed.

In Professor Wood Jones's experience in two Australian medical schools, the demands made upon the occupant of a chair for doing work outside his teaching routine were mainly those of solving little problems for medical men practising in the State and of answering innumerable letters seeking information upon all sorts of matters, usually unrelated to the professional sphere of the recipient. This could hardly be named research work, though it doubtless served a useful purpose to the community in which the medical school was situated.

Sporadic attempts had been and were constantly being made to carry out more ambitious schemes of research in the scientific departments of Australian medical schools, and many of these had met with a considerable degree of success. Some of them redounded to the credit of medical investigation in Australia; but unless the universities of Australia made very considerable reform in the organization of their medical schools, they could not be expected to provide the source of any nation-wide and sustained investigation into the health conditions prevailing in Australia.

In addition to the medical schools, there were the research institutes; some of these were endowed by private benefactions, some were supported in whole or in part by State or Federal funds. Some were attached to hospitals or medical schools and some were on an independent basis. If research of national importance was to be carried out in these institutions, two things were essential. The first was coordination of effort; the second was directorship.

It had to be remembered that many of these institutes, owing to their connexion with hospitals, had of necessity to carry out a great deal of routine testing and examination for the hospital to which they were attached. Their interests were local, and many of their activities had perforce to be of a local and routine character. Nevertheless the burden of teaching did not press upon the staff and there was liberty to engage in real research work. Much of the research work done in certain of these institutions was of high standard; some of it had a distinct bearing upon Australian conditions and Australian problems. Nevertheless, in order to serve a national purpose, there was still the need of coordination of effort and, above all, the question of directorship should be taken into serious consideration. This factor applied with greater force if the third possible form of research organization were contemplated. The third possibility was that research into the health conditions of the people of Australia should not be conducted in the main in the existing medical schools, nor in the research institutes attached to hospitals, but should be established in a central research institute which would coordinate and make use of the efforts of all the existing sources of research work.

Professor Wood Jones spoke of team work and said that the great majority of the problems which confronted the medical research worker were complexes of biological, physical and chemical factors; moreover, the solution of the whole matter was usually incomplete unless human and social conditions were surveyed in their bearing on the question.

For this reason, in both Europe and America, team work in research had been developed to a high degree of perfection. In Australia, but little had been done in the medical schools to combine the efforts of several departments into one organized investigation. Nor was it possible, under the conditions prevailing in most of the medical schools, that such combined work could be undertaken, for so great a proportion of the time of the staff was occupied in the routine of a teaching department that little could be spared for any large-scale team investigation. It was therefore doubtful whether, in the absence of coordinated team work, it was wise to endow with large sums of money the prosecution of such things as cancer research in Australia. Close coordination between medical biologist, chemist and physicist within a single research institute was almost essential if a successful attack was to be made upon the problem of malignancy. It would be one of the outstanding miracles in the history of medical science if the solution of the problem should be revealed to any isolated investigator, no matter how great his scientific attainments or how ample the funds at his disposal.

Any proposed investigation should therefore be very carefully considered by those responsible for the administration of research funds. Investigations into only one aspect of a problem in which multiple factors were involved were not likely to produce very valuable results and, even at the best, were most likely to be lost in the literature already overburdened with isolated and uncorrelated findings. Fortunately there were still many outstanding problems that lay almost wholly within the province of a single branch of medical knowledge, and such problems might be investigated with some possibility of success by a single investigator and his technical staff. Until team work was better organized than it was today in Australia, it would be wise to give preference to this type of investigation in the allocation of research grants. Meanwhile every effort should be made to create conditions that would make well-coordinated team work a possibility in Australian medical schools.

Speaking of schools of research, Professor Wood Jones said that if a broad survey were made of the discoveries that had been made in medical science, it would be found that those which had benefited humanity most had been carried out in a centre where long-continued and undivided attention had been paid to one definite problem. Such centres or schools came into existence, in the main, through the inspiration and life work of one man. The tradition was carried on by his students and by those workers attracted to his laboratory as disciples. In many cases the succession of workers was a long one; but in the end the work was carried to a successful conclusion and humanity benefited.

In Australia it could not be said that any definite school of research had ever been founded. Much work had been done in Australia on hydatid disease, because, locally, the problem was one of some urgency. But all this work was carried out without continuity and in different centres; it would have been effected far better and with far more expedition had a school of research in hydatid disease come into being in any one medical school or medical institute. It was a remarkable fact that none of the leading teachers in Australian medical schools had founded a permanent school of research into any peculiarly Australian problem of national health. Once again it had to be admitted that this state of affairs was due, not to the inability of these men to conduct research or to attract disciples, but to the conditions under which their university posts were held. Nevertheless, it was a matter of the first importance that, no matter where the research was carried out or by whom, every attempt should be made to establish continuity of effort in the investigation of definite health problems in Australia.

In the absence of team work in research there was likely to be a considerable overlapping of individual effort. Such overlapping had for long been a very wasteful element in most scientific work in Australia. The aims of all the medical schools, so far as teaching *et cetera* were concerned, were identical. All medical schools dealt with the same subjects.

Unfortunately the principle of organized research had not yet received full recognition in the various medical schools, with the result that much work was duplicated, some outstanding Australian problems were hardly touched on, and much honest endeavour was more or less wasted through lack of coordination between the various medical schools and research institutes. It was essential that any central body concerned with the organization of medical research work should take steps to ensure that endeavour was not wasted by the overlapping of effort in the different medical schools.

Professor Wood Jones said that medical problems might be divided into two classes: (*a*) those that were world-wide and presented the same aspects in all places; and (*b*) those that by incidence, course, or prognosis varied in different localities and so presented local problems or local aspects of a general problem. It hardly needed to be said that in the minds of those responsible for the administration of funds there was always the question as to the suitability of any proposed research for prosecution in Australia. In Europe and America there were a number of well-endowed and well-equipped institutions for the study of many of the world-wide scourges of humanity, and in certain cases it seemed almost futile (as well as unnecessary) for Australian institutions to compete with them. It was the peculiarly Australian problems, or problems having a peculiar Australian aspect, that needed attention in Australia, and, other things being equal, such researches should have preference over even such pressing problems as the causation and cure of cancer.

Professor Wood Jones then referred to trained technical assistants. He said that generally the medical schools of Australia were equipped with trained technical staffs barely sufficient to cope with the routine conduct of the teaching departments. There was no reserve of technical assistance to meet the extra demands created by special researches. Every head of a department in a medical school was forced to recognize that, in the consideration of the possibility of housing a research worker and offering facilities for research work in his department, the first factor to be taken into account was the burden thrown upon a technical staff sufficient only for coping with the ordinary teaching routine. As a general rule the questions of finance, of provision of apparatus, of obtaining material and of finding the laboratory accommodation were sub-

ordinate to the ever-constant difficulty of obtaining properly trained technical assistance for the research worker.

The reason was not that boys of the right type for training as technical assistants in all branches of laboratory work were not available in Australia. It was due rather to the fact that, under present conditions, the number of posts open to a young man of any ambitions was very limited and that so often these posts were occupied by men who had held them for many years (despite, in some cases, their comparative inefficiency). For the men who occupied the more senior posts there was no prospect of further advancement, and vacancies attractive to the trained, skilled and ambitious young man were rare. For this reason the technical staffs of many of the scientific departments of the medical schools consisted of elderly men who had occupied their positions for many years and looked forward only to retirement, and boys who saw little hope of any advancement in their status. This had led in some cases to the thoroughly uneconomic business of taking on boys fresh from school, employing them as junior laboratory assistants, and then, when they were becoming skilled, losing them, either because the institution was not prepared to pay them a man's wage, or because the boy himself saw no prospects of advancement in his career. Doubtless this was unavoidable with the present meagre finances devoted to the teaching departments of Australian medical schools. But it was a very uneconomic state of affairs that these boys should be trained in a highly skilled occupation and then, when they were entitled to a man's wage, thrown back on an overcrowded labour market which made no use of their specialized skill and training.

Mere money grants to research workers, or to departments in which research was to be carried on, would never guarantee work of the proper standard unless provision was made for securing adequate trained technical assistance for the research worker. Boys of the right type were available and they readily acquired a modicum of the requisite skill; but a long apprenticeship under proper supervision was necessary for ensuring the meticulous attention to accuracy and the development of scientific conscience that were essential attributes of the good technical assistant in research work. It had to be remembered that the whole outlook of the technical attendant who prepared experiments for class demonstration as part of his routine work, differed profoundly from that of the ideal research assistant. The aim of the one was to ensure that by his proficiency in technical details the experiment should demonstrate conclusively the phenomena expected to result from it. Such an outlook on scientific experiment was of necessity disastrous when carried into the realms of pure research, and for this very reason it was not to be expected that the existing staffs of technical assistants in the medical schools could form even the nucleus of the requisite body of trained research technicians. If research was to be fostered in Australian medical schools, it must be made possible for the Australian boy to secure not only the necessary training, but also the prospects of permanence and ultimate advance in his career as a laboratory worker.

If the investigator in Australia conducted his work in a laboratory attached to a medical school, he laboured under the initial difficulty of having insufficient assistance from trained laboratory technicians. If he decided upon clinical research he was at once confronted with a handicap which was perhaps even more severe. This handicap was that imposed by the imperfection of the case records of patients in public hospitals in Australia. It was a regrettable admission, but one freely made by the honorary staffs of our great hospitals, that case records had been so badly kept as to be of little real use in a scientific investigation. Accurately kept case records, containing all facts relevant to the condition and progress of the patient, were the bricks and mortar from which the edifice of real clinical knowledge must be built. Moreover, precise and full *post mortem* records and careful progress reports and follow-up inquiries were bare necessities for clinical research.

In all these directions the clinical research worker found himself handicapped. Before really extensive clinical research upon the prognosis of disease and disability in Australia could be undertaken, an enormous amount of clerical spade work had to be done and a great improvement effected in the standard of record-taking. So much was this need realized that the recently formed Anti-Cancer Council of Victoria had included amongst its objects that of assisting "clerical research in this disease, more particularly by improving the system of following up records of all cases".

So great was the lack of any really full and accurate data concerning the hospital population that it might well be urged that, before extensive research entailing the use of such records was encouraged, the establishment of a department, equipped with a trained clerical staff, should be considered. From such a central office the records of all the hospitals in any capital city could be supervised and collated, and follow-up inquiries could be conducted with regard to patients discharged from the wards. Such inquiries should not be limited to the mere writing of letters to patients scattered round the country; but the registrars of deaths, the police, coroners and charity organizations should also be called upon for assistance in tracing the after-history of such patients; and, when possible and necessary, personal contact should be maintained. Were such a central organization to be created, a great mass of knowledge, at present entirely lacking, could be gained concerning the incidence and prognosis of disability and disease in the people of Australia.

In conclusion, Professor Wood Jones said he was convinced that money could not buy research work of any real value to the community. It was not possible to endow research; but it was possible and expedient to endow the research worker. Many men would be attracted by research funds; the real born research worker would do his work with a disregard to finance so long as he could support himself in his chosen way of life. It was, as a general rule, a waste of money to attempt to create a research worker to deal with a specific problem; it was always a wise investment to place the real research worker in a position of comparative freedom from urgent financial problems.

Professor Harold R. Dew emphasized the fact that for medical research Australia had already incurred a huge capital outlay in buildings and equipment, both in universities and in research institutions; the State hospitals were also well equipped with laboratory facilities. It would be a tragic waste of public money if any more endowment of bricks and mortar were encouraged. What Australia had failed to do was to endow men with good brains to attack special problems.

Professor Dew said that there were three main types of research: fundamental or basic research, clinical research, and research in statistical and other information.

Fundamental research (pathological, chemical or experimental) was decried by some; but it was necessary to realize that a great many of the most brilliant advances had emanated from it. The discoveries of insulin, salvarsan, modern anæsthesia, liver feeding and radiography, and bacteriological and immunological advances had directly followed pure scientific work. In addition, this was by far the best field in which to train young research workers. The experimental method still remained the great test.

This kind of research needed special laboratory facilities, special equipment, special apparatus, trained technicians, trained investigators and contact with other departments; but it could be carried out without patients and without hospitals. It could be undertaken with any prospect of success only in places suitably equipped, where quick contact could be made with other departments, because an apparently simple problem might involve biochemical, physical, pathological or bacteriological factors. Scientific methods were attaining a high degree of accuracy, and observations were becoming quantitative in all experimental work. The correct conditions for this type of work existed at the universities and, to a less degree, at the research institutes.

Clinical research had languished in Australia, not because there was no urge to undertake it, but because

of the many difficulties to be overcome. From the point of view of national health, this aspect of research was all-important. There were certain definite requirements: (i) A good supply of patients, full access to them, and control of their admission, treatment *et cetera*. (ii) The active cooperation of boards of hospitals in affording encouragement and facilities in the form of special beds *et cetera*. They should allow patients to stay in hospital for a sufficient length of time and should provide special nursing and other services. All these things cost money, and the biggest problem was to persuade any hospital board to agree to incur the added expenditure for "academic research work". (iii) Laboratory services. These did not need to be elaborate for the average type of work, but since clinical investigation was becoming much more accurate, special biochemical or pathological investigations might be necessary. All these, however, could be carried out at the better class general hospitals in the capital cities of Australia. (iv) A good record system. Professor Dew entirely agreed with Professor Wood Jones about this matter. There was no hospital in Australia where accurate and scientifically useful records were kept, and from this lack resulted a great loss of clinical knowledge.

Clinical research could be carried out only with special clerical assistance at well-equipped hospitals, particularly at the larger teaching hospitals, at some special hospitals, and at some dental hospitals. Allocation of money to small, inefficient and ill-equipped hospitals should be very carefully made, otherwise the money was dissipated and the chance of success was small. Decentralization in research matters was rarely a good thing and should not be overdone.

Professor Dew said that the statistical or public health side of research was very important. This meant the collection and coordination of information, statistical in type, about disease from the national point of view. Much fuller information was wanted concerning the incidence, distribution, ætiological factors and the results of treatment of disease. Although this type of research mainly dealt with facts, it was becoming more and more important, particularly in pointing the way in which research should go. The health departments could give great assistance in collecting this very important information. This work required the right type of man and certain office facilities; but it, too, was dependent upon accurate records and the cooperation of hospitals or other bodies.

Professor Dew then referred to the types of people available to carry out research. He agreed with Professor Wood Jones that there were very few trained research workers in Australia. Young graduates were capable of doing very good work, and it was tragic that so many good young men had been forced out of Australia by lack of facilities and money. It was a great reflection on Australian civilization that trained scientific workers, on whom the future of the country depended, should be asked to work at labourers' wages. However, in the present condition of affairs money would not provide a sufficient number of research workers, because they were not available; they would have to be trained, and that would take time. Professor Dew referred to a suggestion that research workers should be imported, but opposed it on the ground that it would be inexpedient and risky. A high salary would have to be paid, not many really good men were available, and they would have to be retained even if they proved failures, as they would not come unless assured of permanency.

The lack of trained technicians was almost as serious. It would be relatively easy, however, to train technicians *pari passu* with research workers. It might be necessary to import a few specially trained people for highly specialized work, but for the greater part technicians could be trained relatively quickly in Australia.

Professor Dew classed those available for research work in three groups.

First, there were the full-time workers in Australian universities and research institutes. These were experienced, often senior men, many of whom were at present hopelessly overburdened with routine work. They had good laboratory facilities, plenty of material, original ideas and the correct training and outlook. Many of them had research work in hand, but could not carry it out properly because of lack of assistants and technicians. The universities were in financial straits and could do little more to help, while all the research institutes needed funds. These persons needed help urgently, and grants made to them would do the most good in the shortest time, because results would be apparent very soon. They were looking to this council to help them. After all, it was the heads of these existing institutions who had to be depended on for the training of future research workers, and the council was dependent on them, in the main, for assistance in any scheme of national health improvement. The best way to obtain their active cooperation, to stimulate research and to initiate further research was to help them at once.

Secondly, there was the part-time casual thesis worker. He was rarely of importance in this work and could safely be left to the universities and institutes.

Thirdly, there were the graduates of three to five years' standing, often of the keen, original type, usually under thirty years of age, and ideal for investigational work. From these graduates full-time research fellows could be chosen, with up to three years' tenure, at a salary of £500 *per annum*, and they could be set to work under direction in existing institutions on their chosen problems.

Even if these research fellows in the main did not produce much truly original or great work, they would find out many facts and carry out a great deal of useful spade work. At the end of their service it could be easily determined whether they would be successful research workers or not, and from them could be chosen some who were willing to make research their life's work. Selected workers should be sent abroad on travelling fellowships to complete their training in special techniques, and when they returned they should be given a salary rising to £1,200 a year at least.

It would be necessary to supply each of these men with a technical assistant, whose salary should commence at £250 *per annum*, so that each of these fellowships would cost approximately £800 *per annum*.

In addition, Professor Dew thought that it would be very valuable to supplement some of the existing university fellowships which were at present not sufficiently endowed. This would attract men to take them and would not be very costly—a few hundreds a year should be sufficient in each university.

Professor Dew then asked how this council could help in national research work. He thought that the council should collect all types of information and advise the Government as to its best course of action. The council should stimulate the right kind of research from the national point of view, trying to stop obvious overlapping and allocating money where the best facilities existed. Professor Dew did not agree entirely with Professor Wood Jones in regard to limiting research to work that had not been done abroad, as, after all, many Australian problems were exactly the same as those in other countries. Men of the right type should be stimulated, for they would do good work if they were doing what they wanted to do.

The council should notify research centres as to how it could assist them. But the council could not control research—none of the bodies or institutes would be willing to take orders. The aim should be cooperation.

Professor Dew then recommended that the council should advise the Commonwealth Government on the following lines:

(a) Grants for research should be made after applications had been called for and scrutinized, to skilled research workers who were already trained and working in existing efficient institutions; and to other workers, including general practitioners. Grants should also be made to supplement existing fellowships.

(b) From six to eight full-time junior Commonwealth research fellowships should be endowed, each costing £800 *per annum*: £500 for the fellow, £250 for a technician and £50 for expenses. The work would be carried out in existing institutions on the three types of research mentioned, particularly clinical problems, for a period of one to three years.

(c) Provision should be made for the selection, from the junior research fellows, after training, of travelling fellows to be sent abroad for special training. From these or other selected fellows would be appointed permanent senior research fellows, with a salary up to £1,200 a year and with some provision for their retirement. This would entail an expenditure of £13,000 to £15,000 a year at the time of the fourth year of activity.

Finally, Professor Dew discussed the assessing of claims of individual men for appointment as research fellows. The council must have some form of advisory committee—perhaps a subcommittee in each State—to determine whether the applicant was the right type of man, whether the problem to be attacked was acceptable, and whether the right facilities were available.

Resolutions.

The following resolutions were adopted by the council.

Research.

The council wishes to direct attention to the importance, in initiating a national scheme of encouragement to research, of (*a*) encouraging young medical graduates to take up medical research as a career, and (*b*) securing definite and assured continuity and permanence to the research system now being inaugurated.

As graduates will not decide to take up research as a career unless the permanency of the system is assured, and as the success of this new development depends so materially upon continuity, the council recommends to the Government that such legislation be passed as will ensure a definite annual sum allocated for purposes recommended by this council.

This council recommends that this annual amount be at first £30,000. It is further recommended that any unexpended balance in any year be accumulated for use in succeeding years.

The council does not consider that any new buildings are required, as the existing buildings available for research are adequate for all necessary purposes.

Institutions recognized by the council as adequately equipped and administered for the purposes of research should be registered by the council as approved research institutions.

Any institution may from time to time apply to the council for financial or material assistance for a specified piece of research to be carried out by a nominated worker, together with an intimation of the additional apparatus required.

The council will then decide: (*a*) whether the institution is or should be registered as an approved institution; (*b*) whether the proposed research is approved; (*c*) whether a grant should be given to cover salaries or equipment or both.

Under special conditions a grant may be made for research work by an individual apart from an approved institution, provided the council is satisfied as to the merits of the proposal, the conditions of work, and the qualifications of the worker.

All institutions at present engaged in research work should be circularized and invited to send in any proposals for research.

For the first few years the council will be prepared to recommend assistance to existing institutions for the purpose of making accommodation and equipment adequate for the proper conduct of the research which each proposes to undertake.

The council recommends that a number (not more than ten) of junior research fellowships should be made available. These fellowships should have a tenure of not more than three years (with annual reappointment), subject to satisfactory diligence and conduct. The salary for these fellowships should be £500.

These fellowships should be available, in accordance with proposals received, for both laboratory and clinical research. The persons appointed should work under direction in an approved research institution.

The council recommends that from time to time senior research fellowships should be available at a salary of not less than £1,000 *per annum*. These fellowships should be available, in accordance with proposals received, for both laboratory and clinical research. The persons appointed should be selected from amongst the junior fellows or appointed because of special qualifications or experience.

Grants may be made to medical graduates for part-time research. These grants should be available for both clinical and laboratory research, but preference will be given to clinical research.

These grants should normally be of the value of £250.

Grants, or assistance in other forms, may, from time to time, be made available to Commonwealth and State health departments for: (*a*) occasional assistance to these departments in their inquiries; (*b*) the conduct of special inquiries at the request of these departments.

Grants may be made available to provide for technical assistance to workers engaged in research work whose present resources are insufficient to provide such assistance. It is recognized that a research worker cannot make profitable use of his time and opportunities unless he has the assistance of a trained technician. When, therefore, a grant is made to a research worker, it should be large enough, whenever circumstances justify, to cover the salary of a technician. The council considers that a register of technicians should be compiled.

It is essential, more especially for the study of the social aspects of medicine, that hospital records should be kept more efficiently and that they should contain more complete information. The possibility of considerable and early improvements in this direction should be studied and an endeavour made to induce State hospital authorities and the managing bodies of hospitals to take the necessary steps towards improvement.

Inasmuch as the opportunities for acquiring research experience in certain fields are much greater in other countries than in Australia, the council believes that it will be profitable from time to time to provide travelling fellowships. It does not appear, however, that this should be one of the first steps in the organization of the research system, and, in any event, would only be justified in exceptional cases.

In Australia no institution has yet developed as a recognized centre of inspiration and tradition a "school", as it is usually called, for research in one particular field. Such a school cannot be created; it depends upon the personality and genius of one man; but, should an opportunity present, the development of such a school might well be encouraged.

While research in any field of medicine should be recognized, the council is of opinion that preference should be given to problems of especial Australian identity or application.

Grants may be made for the purpose of supplementing insufficient income from existing endowments for research. Each such case should be considered individually.

The allocation of a grant for research purposes should be upon condition that the results of the research, when published, should contain a short preface indicating that the work had been carried out under the approval of, and with financial assistance provided by, the council.

The council considers it necessary to appoint a reference subcommittee, which shall meet not less often than once in three months. For the purpose of obtaining special information upon any of the various subjects with which it has to deal, the council will, and this subcommittee is empowered to, consult any person whose advice is desired.

This subcommittee should consist of Professor F. Wood Jones, Professor H. R. Dew, Dr. H. Ritchie, Dr. Newman Morris, and the Chairman.

When this subcommittee meets in any capital city, it shall include also the members of this council resident in that city.

The representatives of each State on this council will be consulted by the subcommittee upon any matter affecting that State.

Some research institutions, including university laboratories, are unable to carry out research work or even to give that inspiration to students which is necessary and is desired by the staff, by reason of lack of demonstrators and technicians. While to some extent the rectification of these conditions is the responsibility of the governing authorities of the institutions concerned, this council can materially assist towards the better prosecution of research

by some financial assistance for purposes within the limits of its functions. It is considered that grants may be made for these purposes to universities and other research institutions.

This council considers that dental research should be encouraged and recognized as part of the general scheme of research under the council, and, in order that the whole position may be carefully studied, resolves that the proposals submitted be referred to the reference subcommittee.

In respect of those applications for grants and assistance which have already been received, the council resolves that all the applicants be requested to re-submit their applications on a short form which will be drafted by Professor Dew and submitted to the reference subcommittee.

All applications will then be examined by the reference subcommittee and prepared for presentation to this council.

Tuberculosis.

The council considers that, for the efficient control of tuberculosis, adequate attention must be given to the following considerations:

A. The economic factor is definitely the most important aspect of the campaign against tuberculosis. It is necessary that the resistance of all members of the family should be maintained at the highest possible level. The wage-earner of the family frequently will not leave his family so long as he is able to contribute anything towards its support. He is usually unable to do this adequately. Possibly the greatest advance towards the effective control of tuberculosis would be the provision of adequate financial support to ensure the effective nutrition of the family under suitable environmental conditions.

B. The removal of the source of active infection from the family is of fundamental importance, since it is recognized that children are very vulnerable to the disease. This involves either the admission of infective patients to sanatoria or the removal of children from the home. Sufficient accommodation should therefore be provided in sanatoria for the treatment of all infective tuberculous patients. Provision should also be made in suitable institutions for the accommodation and treatment of children whom it is considered advisable to remove from their homes.

For these reasons it is desirable:

That, in respect of patients suffering from tuberculosis, provision should be made for a pension to be paid similar to that paid by the Repatriation Department and Commonwealth Invalid Pensions Department combined in respect of tuberculous soldiers receiving a service pension.

That the pension paid to the tuberculous patients should be paid in full irrespective of whether the patient is undergoing treatment in a State institution or not, in order that the nutrition of his family may be adequately maintained.

That every State health department should ensure the full development of an efficient system of tuberculosis clinics and with particular reference to the periodical examination of close contacts and the immediate treatment of conditions suspicious of, or leading to, incipient infection.

That the Commonwealth Government consider the practicability of extending the powers of the Repatriation Commission to include the periodical examination and treatment of close contacts of tuberculous soldiers.

That State Governments should consider the necessity of locating and eliminating defective conditions of housing, house aggregation and overcrowding as one means of reducing the incidence and perpetuation of tuberculosis.

The council draws the attention of the Government of Tasmania to the high incidence of, and mortality from, bone and joint tuberculosis in Tasmania. It is recommended that this problem be investigated in order to determine definitely the source of the infection. To this end the type of bacillus—whether bovine or human—should be ascertained.

In this connexion the part played by the bovine bacillus is well recognized, and close attention should be given to the possibility of the infection being carried by milk, and all measures taken not only to eradicate tuberculosis from all dairy herds, but to maintain this condition of freedom from tuberculosis continually.

Leprosy.

The council views with some concern the tendency of leprosy to spread in two of the States amongst aborigines and to a lesser but definite extent amongst whites, and makes the following recommendations:

1. It is imperative that any leper discovered in Australia should be placed under conditions permitting of full modern medical treatment and continuous and immediate laboratory facilities, and under the continuous supervision of a medical man with special knowledge of leprosy.

2. It is important that each State which has not the necessary powers should provide full legal powers for the periodical examination and any necessary detention of persons (*a*) suspected of being infected with leprosy, (*b*) who have been in contact with a known case of leprosy.

3. Because of the desirability of intensive study of early cases and of the progress of the disease among aborigines, Commonwealth assistance to the extent of £500 per annum might be afforded to assist this work at a selected spot in the Palm Island group, and assistance might be afforded to Western Australia also to permit of extension of the survey and examination of aborigines.

Public Health Education.

1. The council recommends that health films be obtained and that these be selected by a committee consisting of Sir Victor Wilson, Dr. E. S. Morris and Professor Harvey Sutton.

Suitable arrangements for distribution should be made. It is, however, considered that, as soon as possible, arrangements should be made for the production in Australia of health films of a high standard. The Department of Commerce has already sufficient resources, and it is recommended that these facilities be fully utilized.

2. Publicity under the direction of competent persons would be of great value, and it is recommended that the Commonwealth and State Governments should institute a definite system of public health education, utilizing printed matter, films and broadcasting.

Legal Control of Medical Practice.

The following resolution was carried, the State representatives of Queensland and South Australia dissenting:

1. In view of the desirability of securing more complete control of unqualified practice and of eliminating the difficulties inherent in the present system of registration under six State acts and two Commonwealth ordinances, it is recommended either that the Commonwealth be given constitutional authority of the kind now embodied in State medical acts or that steps be taken by the authorities concerned to secure uniformity in the medical acts.

2. The council considers that practising medical men should be permitted to broadcast health addresses under their own names at the invitation of the Commonwealth or State health departments.

Hygiene of Childhood.

The council directs the attention of governments in Australia to serious neglect in adequate supervision of the bodily development of children before and during school age. The important influence on individual health in the community of supervision of the growing child up to and including the stage of adolescence has been abundantly demonstrated.

While something is being done on sound lines already, a relatively small portion of the field has been covered. The council considers that the whole system of health supervision of children should be immediately reviewed with the object of securing: (*a*) regular and complete supervision of bodily health during infancy and childhood to the age of sixteen years; (*b*) regular instruction of all children in the elementary principles of hygiene and in physical culture; (*c*) regular instruction of all girls in the composition and preparation of food.

The council considers that every endeavour should be made to ensure that each child should be medically examined at least once a year; it is desirable that the family medical attendant should be associated with these examinations as far as possible.

The training of teachers should include instruction in physiology, physical culture, and the composition and preparation of food.

The council cannot accept the present state of supervision of child health as adequate, nor indeed as being the maximum that the public will permit. It believes that a definite extension on lines indicated will receive widespread public approval.

Rheumatic Infections and Heart Disease.

A. The council, recognizing the serious effects of rheumatic infection and associated heart disease on the national health, (*a*) urges Commonwealth and State Health Departments to investigate the incidence of rheumatic infection and the possible causative factors; (*b*) resolves that this subject be made a major subject for consideration at next meeting.

B. The council requests the chairman to arrange for consultation between Dr. MacCallum and the Commonwealth Statistician to consider the possibility of an amendment of the International List of Causes of Death so that deaths from diseases of the heart and circulation may be officially recorded on an ætiological basis. The results of this consultation will be reported by the chairman to the members of the council for their comments, which will be correlated and placed before the Conference of Commonwealth and State Statisticians.

Prevention of Blindness.

In view of the complexity of the issues raised by the deputation from the Interstate Conference of Blind Institutions, the council resolves that the cooperation of the Federal Council of the British Medical Association be sought with the object of appointing a committee to formulate definite proposals for the prevention of blindness and such social measures as may be applied for the benefit of the partially blind and to agree upon a definition of blindness.

British Medical Association News.

VICTORIAN BRANCH NEWS.

THE following items of news, of particular interest to members of the Victorian Branch of the British Medical Association, are published at the request of the Council of the Branch.

Lodge Contract.

It has been customary for certain United Friendly Societies' dispensaries to issue to patients prescription books containing rules and regulations, and including a section detailing the duties of the medical officer and the fees he is entitled to charge for confinements *et cetera*.

The code of duties set out is applicable only to doctors employed by friendly societies' institutes and does not apply to members of the Branch giving service under the terms of the Wasley award. Discussions are proceeding with the Dispensaries Association, and it is hoped that a method will be found of overcoming the present confusion.

Commission on a Medical Account.

A member complained in 1936 that the authorities of a prominent private school had suggested that they should collect the doctor's fees and retain a commission of 10%. Such an arrangement was considered improper, as savouring of a secret commission; as the result of representations it is unlikely that the proposal will be made again.

Child Welfare.

Up to the present, baby health centres have not undertaken to supervise children over the age of two years, and the world-wide problem of the care of the toddler is causing concern to many thinking members of the community. Suggestions of the Victorian Baby Health Centres Association, that the facilities of the centres should be extended to children of from two to five years of age, were recently submitted, and the Branch Council considers that any extension of the work beyond periodical weighing and measuring should be under adequately paid medical supervision.

Public Medical Officers.

The status and salaries of medical officers employed by the Government in this State have for many years been lower than those obtaining in other parts of the Commonwealth. Discussions with the Public Medical Officers' Association have resulted in the drafting of a classification and salary scale acceptable to the doctors concerned, and arrangements are now being made to submit it to the State Ministry.

Reference of Patients to Opticians.

A request of the Ophthalmological Section of the Victorian Branch of the British Medical Association, that it be declared unethical for a practitioner to refer patients to an optician for the testing of sight and prescription of glasses, was answered in the following terms:

> While the Branch Council does not approve of the practice of members referring cases to opticians, it is not prepared to recommend that the practice be declared unethical.

Civil Aviation: Landing Grounds.

Following representations from the Federal Council that the provision of proper aerodromes in country districts was a matter of public importance, in view of the fact that medical men were frequently asked to fly to urgent cases and that at times patients were transported by air, circulars were sent to all shire councils in Victoria and they were asked to give the question their attention. A surprising amount of interest has been displayed by local authorities and many of them intend to take steps to establish properly equipped landing grounds in their districts.

Medical Service to Wards of State.

Under the *Financial Emergency Act* the salaries of doctors attending children under the care of the Children's Welfare Department were, in common with other salaries, compulsorily reduced. The anomalous position now exists that, despite the fact that all other salary cuts have been restored, no attempt has been made by the Government to restore the salaries of the medical officers concerned. Repeated representations have been made and it is hoped that they will shortly be heeded.

It does not appear to be generally known that when a ward of the State is an inmate of an orphanage or home, the Children's Welfare Department is responsible for the medical care of that child; and that a doctor attending the orphanage, home *et cetera* (in many cases in an honorary capacity) is entitled, after appointment in the proper form, to claim from the department 10s. *per annum* for each child attended.

Entertainment of Guests.

Members of the Federal Council and executive officers of the Australasian Medical Publishing Company, Limited, were entertained by the Branch Council at dinner at the Hotel Windsor on January 27, 1937. The Council was honoured also by the attendance of Sir Edmund Spriggs, Physician-in-Chief, Ruthin Castle, North Wales; Professor Wood Jones, the representative of the universities on the recently formed National Health and Medical Research Council; and Dr. H. N. Featonby, who will shortly assume office as Chief Health Officer for Victoria.

Council Membership.

Owing to his departure from the district, Dr. S. J. Newing has resigned his position as representative of the Western Suburbs Subdivision and Dr. M. H. Box has been appointed in his place.

Commonwealth Coronation Contingent.

Congratulations have been forwarded to Colonel E. F. Lind, a member of the Victorian Branch, who has been appointed commander of the Commonwealth coronation contingent.

Chief Health Officer for Victoria.

The Chief Health Officer of Victoria, Dr. E. Robertson, will retire on April 1, 1937, after many years of valuable service, and will be succeeded by Dr. H. N. Featonby.

The Branch Council, in wishing Dr. Robertson continued good health in his retirement, looks forward to the same happy relationship with his successor as has been enjoyed in the past.

NOTICE.

The following notice is published at the request of the Medical Secretary of the Victorian Branch of the British Medical Association.

At the request of the Victorian Criminal Investigation Bureau members of the British Medical Association are informed that a diathermy machine, make unknown, serial number 1,092, with accessories, has been stolen from Queensland.

This warning is issued in case the machine is submitted to any prospective purchaser.

NOMINATIONS AND ELECTIONS.

The undermentioned has been elected a member of the New South Wales Branch of the British Medical Association:

Gatenby, Harold Bowers, M.B., B.S., 1936 (Univ. Sydney), St. George District Hospital, Kogarah.

[In the issue of February 20, at page 307, this name was wrongly announced as "Gatenbury, Harold Bowers".]

Medical Societies.

THE UROLOGICAL SOCIETY OF AUSTRALASIA.

The inaugural meeting of the Urological Society of Australasia was held on January 7, 1937. It was decided that membership of the society should be limited to surgeons practising solely the specialty of urology.

The foundation members are: Dr. R. H. Bridge (Sydney), Dr. M. S. S. Earlam (Sydney), Dr. C. Edwards (Sydney), Dr. R. G. S. Harris (Sydney), Dr. J. W. S. Laidley (Sydney), Dr. K. L. H. Kirkland (Sydney), Dr. J. J. Power (Brisbane), Dr. E. R. Reay (Christchurch), Dr. A. S. Roe (Brisbane), Dr. J. T. Tait (Melbourne), Dr. R. J. Silverton (Sydney), Dr. A. Walker-Smith (Sydney).

The following office-bearers were elected:

President: Dr. R. H. Bridge.

Vice-President (President-Elect): Dr. J. J. Power.

Honorary Secretary and Treasurer: Dr. K. L. H. Kirkland.

Royal College of Surgeons of England.

PRIMARY FELLOWSHIP EXAMINATION.

The following announcement regarding the primary fellowship examination of the Royal College of Surgeons of England is published at the request of the Secretary of the Royal Australasian College of Surgeons.

1. The primary examination in anatomy and physiology will be held during November-December, 1937, in Melbourne, Sydney and Dunedin, under the following conditions:
2. The papers will be written simultaneously in all three centres, beginning on Monday, November 29, 1937, and the *viva voce* part of the examination will begin in Melbourne during the same week, in Sydney during the week following that in which the papers are written, in Dunedin during the second or third week after the written papers.
3. The result will be announced at the termination of the examination in each centre.
4. The examination is open to candidates who are graduates or undergraduates of the medical faculty of any university recognized by the Royal College of Surgeons of England, and who comply with the conditions of the regulations. (The recognized universities in Australasia are the Universities of Adelaide, Melbourne, Sydney and Dunedin.)
5. Copies of the regulations, forms of application for admission to the examination, and the schedule of the certificates required may be obtained, free of charge, from The Secretary, The Royal Australasian College of Surgeons, Spring Street, Melbourne, C.1.
6. Completed forms of application, together with the certificates required by the regulations, must reach the Secretary of the Royal Australasian College of Surgeons not later than Saturday, August 1, 1937.
7. The fee for admission to the examination, or reexamination, is £25 sterling, which must be paid to the Secretary of the Royal Australasian College of Surgeons not later than Monday, November 1, 1937.
8. Candidates who withdraw from the examination, owing to any cause whatsoever, after they have paid their fees, will be reimbursed to the extent of half the amount of the fee which they have paid.
9. All inquiries concerning the examination to be addressed to the Secretary, The Royal Australasian College of Surgeons, Spring Street, Melbourne, C.1.

Horace H. Rew,
Director of Examinations, Royal College of Surgeons of England.

July 31, 1936.

Correspondence.

GOUT IN AUSTRALIA.

Sir: You have performed a service in calling attention to gout in the "Current Comment" of December 19, 1936, page 861. You refer to it as a rare disease in Australia. But in Brisbane, and perhaps throughout Queensland, gout is by no means rare. Before writing this I have confirmed my own impression with the opinions of several colleagues. One man could quote four patients under treatment for gout almost at the same time: an old man of 73, who had had attacks in the hands and feet at intervals for twenty years; a woman of 37, first seen in a violently acute attack, who had suffered off and on for 28 years, who also had chronic nephritis and gave a history of lead poisoning in childhood; a man of 50, with large and numerous tophi; and a man of 43. As well as the classical gout of adults, cases of juvenile gout are to be seen from time to time. It is tempting to connect this

comparative frequency with the notoriously high incidence of lead nephritis in Brisbane children. I trust that, in addition to the Australian Juvenal who will arise to satirize the gouty, some clinico-pathologist will arise to grasp the opportunity for scientific investigation.

Yours, etc.,

E. H. DERRICK.

Laboratory of Micro-Biology and Pathology,
Brisbane,
February 24, 1937.

ANALGESIA DURING LABOUR.

SIR: Under the heading "Some Methods of Analgesia during Labour" in *The British Medical Journal* dated November 28, 1936, page 1072, just received, there is given an outline of rectal ether and rectal paraldehyde, methods which might with advantage be recommended for trial in Australian maternity hospitals.

It would be interesting if some of the leading obstetricians in Australia could give us any details of such methods, if any are at present in use.

We have recently conducted a series of thirty cases in which "Nembutal" was given, another thirty cases being given "twilight sleep" by way of comparison. The records have been tabulated, and results indicate that "twilight sleep" was more effective in giving relief, but that "Nembutal" was also effective.

The series was selected from the last consecutive 170 confinements, those cases being taken which appeared to have long first and second stages, and several with delayed second stages.

The dose of "Nembutal" given was either one or two capsules, that is, one and a half or three grains of "Nembutal", given in early labour, when the pains were considered severe, the stage reached corresponding to a two-fingers'-breadth dilatation. At full dilatation one further capsule of "Nembutal" was given.

It was found that the "Nembutal" took effect much more rapidly if both ends of the capsule were pricked with a sterile needle.

Results varied from slight relief to complete analgesia, followed by moderate amnesia. No ill-effects to the child were noticed.

More than 50% of the cases, when the "Nembutal" was given early, were satisfied with the relief obtained.

A few cases were given morphine sulphate, one-sixth of a grain (following the two capsules of "Nembutal" in the early stage), at the stage of full dilatation, with relief. It is, however, not considered advisable to give this if labour is likely to terminate within two hours, owing to possible apnœa of the fœtus or slow establishment of fœtal respiration.

The "twilight sleep" series were given morphine sulphate (one-sixth of a grain) and hyoscine hydrobromide (one two-hundred-and-fiftieth of a grain) at the stage of strong early labour pains with a dilatation of two fingers' breadth estimated by *per rectum* examination. This was followed by three injections of hyoscine hydrobromide (one four-hundred-and-fiftieth of a grain) at two-hourly intervals. This was found to give more satisfactory analgesia, and the amnesia was also fairly uniformly established.

From this series I can recommend the latter technique as superior to bromide or other drug medication, provided regular auscultation of the fœtal heart beat and careful observation of maternal condition is undertaken.

I wish to acknowledge my indebtedness to Dr. R. Beard, of North Terrace, Adelaide, for the supply of "Nembutal" and his assistance with the work and permission to publish these remarks.

Yours, etc.,

H. T. ILLINGWORTH, M.B., Ch.M.,
Resident Surgeon.

Queen's Home,
Rose Park,
Adelaide,
January 13, 1937.

Post-Graduate Work.

WEEK-END COURSE AT WAGGA WAGGA.

THE New South Wales Post-Graduate Committee in Medicine announces that, in conjunction with the Southern District Medical Association, it will hold a week-end course at Wagga Wagga on Saturday, March 20, and Sunday, March 21, 1937. The following programme has been arranged.

Saturday, March 20 (at the Riverina Club).

2 p.m.—"The Operative and Post-Operative Treatment of Some of the More Common Conditions in the Region of the Head and Neck", Dr. A. Aspinall.
3 p.m.—"The Problem of Arterial Hypertension", Dr. J. Kempson Maddox.
4 p.m.—Annual meeting of the Southern District Medical Association.
7 p.m.—Dinner at the Commercial Hotel.
8 p.m.—Lecturettes: (*a*) "Post-Operative Care of Abdominal Cases (Paralytic Ileus and Acute Dilatation of the Stomach *et cetera*)", Dr. A. Aspinall. (*b*) "First steps in the Management of *Diabetes Mellitus*", Dr. J. Kempson Maddox. (*c*) "Ketogenic Diet in the Treatment of Urinary Infections", Dr. L. R. Lennon.

Sunday, March 21 (at the District Hospital).

10 a.m.—"The Treatment of Fractures, Simple and Compound, after Severe Accidents", Dr. A. Aspinall.
11 a.m.—"The Treatment of Chronic Arthritis in General Practice", Dr. J. Kempson Maddox.
12 noon.—General Discussion.

The fee for the course will be £1 1s. Those intending to be present are requested to notify Dr. L. R. Lennon, 45, Simmons Street, Wagga Wagga, as soon as possible. Applicants should also state whether they intend to be present at the dinner.

PORTRAIT OF PROFESSOR W. A. OSBORNE.

IT is the desire of the many friends and old students of Professor Osborne that his portrait should be painted and presented to him, and a commission has been placed with Mr. McInnes. A subscription list has been opened, the subscriptions being fixed at half a guinea. Anyone wishing to be associated with this recognition of Professor Osborne's long services to the University of Melbourne is invited to address a cheque to one of the undersigned, at Medical Society Hall, 426, Albert Street, East Melbourne, C.2.

B. T. ZWAR.
H. B. DEVINE.
ALAN NEWTON.
VICTOR HURLEY.
SIDNEY SEWELL.

Additional subscriptions have been received from the following: D. D. Browne, H. A. Woodruff, A. M. Wilson, Alan Newton, J. M. Andrew, Charles Sutherland, G. H. Wickens, L. J. Clendinnen, A. B. P. Amies, C. H. Hembrow, Stanley Argyle, Ernest Spargo, R. Howden, D. J. Thomas, Clive Stephen, B. B. Scott, R. K. Scott, E. Robertson, S. V. Sewell, E. R. Cordner, H. M. Hewlett, J. A. Cahill, J. F. Williams, L. S. Latham, H. C. Colville, J. A. Larwill, Leon Jona, Jacob Jona.

The total amount received is now £70 7s.

Obituary.

ALBERT HARDING PORTER.

WE regret to announce the death of Dr. Albert Harding Porter, which occurred on May 24, 1936, at Merino, Victoria.

Diary for the Month.

Mar. 9.—New South Wales Branch, B.M.A.: Ethics Committee.
Mar. 9.—New South Wales Branch, B.M.A.: Medical Politics Committee.
Mar. 12.—Queensland Branch, B.M.A.: Council.
Mar. 16.—New South Wales Branch, B.M.A.: Council (Quarterly).
Mar. 17.—Western Australian Branch, B.M.A.: Branch.
Mar. 18.—New South Wales Branch, B.M.A.: Annual Meeting.
Mar. 23.—New South Wales Branch, B.M.A.: Council.
Mar. 24.—Victorian Branch, B.M.A.: Council.
Mar. 25.—South Australian Branch, B.M.A.: Branch.
Apr. 2.—Queensland Branch, B.M.A.: Branch.
Apr. 6.—New South Wales Branch, B.M.A.: Organization and Science Committee.

Medical Appointments.

Dr. A. E. Colvin has been appointed a Member of the New South Wales Medical Board.

* * *

Dr. H. B. Taylor has been appointed an Analyst, pursuant to the provisions of the *Pure Food Act*, 1908, of New South Wales.

* * *

Dr. E. V. Anderson has been appointed Medical Referee at Melbourne, under the provisions of the *Workers' Compensation Act*, 1928, of Victoria.

* * *

Dr. E. S. A. Meyers has been appointed a Medical Officer, Office of the Director-General of Public Health, New South Wales.

* * *

Dr. P. N. Grieve has been appointed Government Medical Officer at Cooktown, and a Health Officer for the purposes of *The Health Acts*, 1900 *to* 1936, of Queensland.

* * *

Dr. J. P. Ainslie, Dr. H. J. Gray and Dr. J. P. Kenny have been appointed Members of the Dental Board of Western Australia for the years 1937-1938-1939.

* * *

Dr. F. K. Wallace has been appointed Medical Inspector of Seamen at the Port of Broome, Western Australia, under the provisions of the *Navigation Act*, 1912-1935, of Western Australia.

* * *

The following have been appointed members of the State Nutritional Advisory Board of Queensland: Sir Raphael Cilento, Dr. E. H. Derrick, Dr. L. St. V. Welch, Dr. A. D. D. Pye, and Professor D. H. K. Lee.

* * *

The following have been appointed, pursuant to the provisions of *The Medical Act*, 1894, of Western Australia, Members of the Medical Board constituted by that Act: Dr. R. C. E. Atkinson (President), Dr. T. L. Anderson, Dr. D. D. Paton, Dr. A. H. Gibson, Dr. D. M. McWhae, Dr. G. W. Barker, and Dr. H. B. Gill.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xxvi to xxviii.

Alfred Hospital, Prahran, Victoria: Honorary Surgeon.
Children's Hospital, Carlton, Victoria: Honorary Officers.
Federal Council of the British Medical Association in Australia: Assistant General Secretary.
Public Service Board, Adelaide, South Australia: "Neale" Research Pathologist.
Renwick Hospital for Infants, Summer Hill, New South Wales: Resident Medical Officer.
The Women's Hospital, Crown Street, Sydney, New South Wales: Junior Resident Medical Officer.

Medical Appointments: Important Notice.

Medical practitioners are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
New South Wales: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
Victorian: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
Queensland: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY Hospital are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
South Australian: Secretary, 178, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
Western Australian: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

Editorial Notices.

Manuscripts forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to The Medical Journal of Australia alone, unless the contrary be stated.

All communications should be addressed to the Editor, The Medical Journal of Australia, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, The Medical Journal of Australia, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such a notification is received within one month.

Subscription Rates.—Medical students and others not receiving The Medical Journal of Australia in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £1 for Australia and £1 5s. abroad *per annum* payable in advance.